Diabetes Management In The School Setting

A Resource Guide for School Health Nurses

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Missouri Department of Elementary and Secondary Education

Marjorie Cole, RN, MSN
State School Nurse Consultant
Missouri Department of Health and Senior Services
Healthy Communities and Schools Unit

Deborah Cook, RN
Missouri Association of School Nurses
Kennett Public Schools

Marie Davis
Executive Director
Juvenile Diabetes Research Foundation

Martha Fuhrman, RN, BSN, CDE
Diabetes Nurse Educator
St. Mary's Health Center

Jean Grabeel, RN, BSN, CSN, MEd
Missouri Association of School Nurses
Springfield School District

Kathy Greer, RN, MEd, NCSN
Missouri Association of School Nurses
Lee Summit School District

Dianne Herndon, RN
Missouri Association of School Nurses
Parkway School District

Glenda Kelly, RN, MSN
Public Health Nursing Liaison
Missouri Department of Health and Senior Services
Center for Local Public Health Services

Renee Paulsell,
Area Executive Director
American Diabetes Association

Diane C. Rackers, Assistant Manager
Missouri Department of Health and Senior Services
Missouri Diabetes Prevention and Control Program

Rita Reeder, MS, RD
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Missouri Department of Health and Senior Services
Cancer Control Unit

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Missouri Dietetic Association
Kirksville, Missouri

David Goldstein, MD
Pediatric Endocrinology
University Hospital and Clinics
Columbia, Missouri

Melissa Lawson, MD
Adolescent Medicine Specialist
University Hospital and Clinics
Columbia, Missouri

Daryl Lynch, MD
Adolescent Medicine Specialist
Children's Mercy Hospital
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Chris Ohlemeyer, MD
Adolescent Medicine Specialist
Cardinal Glennon Hospital
St Louis, Missouri

Debbie Pettis, RN, BSN, MST, CDE
Diabetes Educator
Children's Mercy Hospital-South
Overland Park, KS

Danita Rife, RN, FNP, CDE
Central Missouri Area Diabetes Educators
Columbia, Missouri

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Developing A Diabetes Management Program In Your School

A diabetes management program indicates a responsiveness of school personnel to meet the needs of students with diabetes. Creating procedures that outline responsibilities should alleviate anxiety personnel may have about helping students who have diabetes.

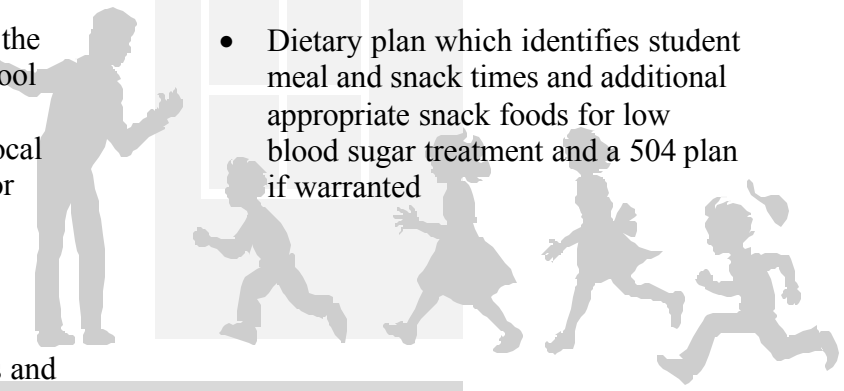
A management program should include:

- A plan for communicating with the parent/guardian and the medical provider
- School policies and procedures for administering medications and handling body fluids as encountered with blood sugar monitoring
- Specific actions for school personnel to perform in the management program

The registered professional school nurse coordinates, plans and implements an effective diabetes management plan. If the school district does not employee a school nurse, it is imperative that the student's physician or health care provider and local public health department are notified for assistance.

The school nurse is responsible for the development of an Individualized Healthcare Plan (IHP), which identifies and documents an individual student's healthcare needs. Critical to the success in establishment of an IHP is the use of a systematic approach to problem-solving particular to the nursing process and identified as the Standards of Clinical Nursing Practice (ANA, 1996). These standards are Assessment, Diagnosis, Outcome Identification, Planning, Implementation and Evaluation. See example IHP in First Steps section. In developing the IHP the school nurse collects the following information, which becomes a part of the overall diabetes management plan:

- A Comprehensive Diabetes Health History
- Emergency Action Plan which describes a specific plan for handling high and low blood sugar episodes including appropriate treatment of foods and medications
- Blood glucose and insulin procedures for student self-monitoring and administration of insulin
- Dietary plan which identifies student meal and snack times and additional appropriate snack foods for low blood sugar treatment and a 504 plan if warranted



Source: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses.

First Steps

The following steps are what the school health nurse should do when a newly diagnosed student with diabetes is seen or presents. These steps are in sequential order and the forms mentioned and included in the manual will give you all of the tools needed to complete these steps. It is recommended that you prepare your student's file prior to school starting so all necessary paperwork and approval signatures can be obtained.

1. School nurse initiates the ***Diabetes Health History Form and Management Planning Tool*** and arranges for a family conference prior to the student's entry or return to school.

2. School nurse interviews the parent/guardian; completes the ***Diabetes Health History Form and Management Planning Tool,*** a ***HIPAA-Compliant Authorization for Exchange of Health & Education Information,*** and a ***HIPAA-Compliant Authorization for Release of Health Information;*** and has the forms signed by the parent/guardian. At this time, the school nurse provides the parent/guardian with the ***Prescription Medication Order and Permission to Administer Medication and to Test Blood Sugar Form*** to be completed by the health care provider and returned to the school nurse to keep on file.

3. School nurse prepares the ***Letter to Health Care Provider Regarding Health Care Plan*** and sends it to the health care provider with appropriate attachments (i.e., ***Emergency Action Plan Diabetes Healthcare***, etc.).

4. Parent/guardian provides the school with blood glucose monitoring equipment and supplies, medications, and snacks for treatment of hypoglycemia. (Information on glucose monitoring equipment and supplies, and snacks for treatment of hypoglycemia can be found in the Glucose Management section of this manual. Information on medications can be found in the Medications section of this manual.)

5. School nurse trains appropriate designated school staff in emergency action procedures and disseminates information regarding diabetes to appropriate school staff. For example, the classroom teacher and assistant, playground supervisors, lunchroom monitors, bus drivers, coaches, etc. Training of school staff should be documented on the ***Staff Training Record*** and kept in appropriate files. The following resources are appropriate for training school staff:

   - The American Diabetes Association's curriculum ***"Diabetes Care Tasks at School: What Key Personnel Need to Know"*** that can be accessed at: ***http://www.diabetes.org/schooltraining***

   - The National Diabetes Education Program (NDEP) school manual ***"Helping the Student with Diabetes Succeed: A Guide for School Personnel" Section 2, "Actions for School Personnel, Parents and Students"****, pages 32-46*.

6. School nurse completes the ***Blood Glucose and Insulin Procedures*** form after observation of the student (if the student will do self-monitoring at school).

7. School nurse plans for the nutritional needs and supplementary snacks and initiates an appropriate ***504 Dietary Plan*** if indicated. Be sure to communicate with your food service manager to confirm the nutrition content of meals.

8. School nurse initiates and evaluates the student's ***Individualized Health Plan (IHP)*** and makes modifications as needed. (A blank IHP form is provided for the school nurse's convenience.)

9. School nurse maintains consistent communication with student, staff, and parent/guardian, in order to provide for the appropriate plan of care.

Additional forms and resources that are included in this section that will be useful to school staff:

- ***"Special Health Care Needs: Administrative Guidelines"*** - contains information for developing a 504 Plan, as well as sample forms.

- ***"Health Services Department Emergency Plan - Diabetes"*** Sample #2, is another example of an Emergency Plan that can be used as an alternative for the Emergency Action Plan Diabetes Healthcare.

Diabetes Health History Form and Management Planning Tool

The purpose of this form is to aid the school nurse in gathering the information necessary to develop the student's Individualized Health Plan and Emergency Action Plan.

Effective Dates: _____

Student's Name: _____

Date of Birth:_____ Known Allergies:_____

Grade:_____ Homeroom Teacher: _____

Diagnosis: ☐ diabetes type 1 ☐ diabetes type 2 Date of diabetes diagnosis: _____

Last hospitalization/ER visit for diabetes: _____ Has glucagon ever been administered? ☐Yes ☐No

CONTACT INFORMATION
Mother/Guardian: _____

Address:_____

Telephone: Home _____Work_____ Cell _____

Father/Guardian:_____

Address:_____

Telephone: Home _____ Work_____ Cell _____

Student's Doctor/Health Care Provider:

Name:_____

Address:_____

Telephone: _____ Emergency Number: _____

Preferred Hospital: _____

Other Emergency Contacts:
Name:_____

Relationship: _____

Telephone: Home_____Work _____Cell _____

Notify parents/guardian or emergency contact in the following situations:
_____

_____

Diabetes Health History Form and Management Planning Tool *(continued)*

BLOOD GLUCOSE MONITORING

Target range for blood glucose is ☐ 70-150 ☐ 70-180 ☐ Other _____

Usual times to check blood glucose _____

Times to do extra blood glucose check (*check all that apply*)

- ☐ before exercise
- ☐ after exercise
- ☐ when student exhibits symptoms of hyperglycemia
- ☐ when student exhibits symptoms of hypoglycemia
- ☐ other (explain): _____

Can student perform own blood glucose checks? ☐ Yes ☐ No
Exceptions: _____

Type of blood glucose meter student uses: _____

INSULIN

Type and dosage of insulin: _____ Timing: _____

Type and dosage of insulin: _____ Timing: _____

1. Can student give own injections? ☐ Yes ☐ No
2. Can student determine correct amount of insulin? ☐ Yes ☐ No
3. Can student draw correct dose of insulin? ☐ Yes ☐ No

FOR STUDENTS WITH INSULIN PUMPS

Type of pump: _____ Basal rates _____ 12 am to _____
_____ _____ to _____
_____ _____ to _____

Type of insulin in pump: _____ Type of infusion set_____

Insulin/carbohydrate ratio: _____ Correction factor: _____

Student Pump Abilities/Skills:	***Needs Assistance***
Count carbohydrates	☐ Yes ☐ No
Correct bolus amount for carbohydrates consumed	☐ Yes ☐ No
Calculate and administer corrective bolus	☐ Yes ☐ No
Calculate and set basal profiles	☐ Yes ☐ No
Calculate and set temporary basal rate	☐ Yes ☐ No
Disconnect pump	☐ Yes ☐ No
Reconnect pump at infusion set	☐ Yes ☐ No
Prepare reservoir and tubing	☐ Yes ☐ No
Insert infusion set	☐ Yes ☐ No
Troubleshoot alarms and malfunctions	☐ Yes ☐ No

Diabetes Health History Form and Management Planning Tool *(continued)*

FOR STUDENTS TAKING ORAL DIABETES MEDICATIONS

Type and dosage of medication: _____ Timing: _____

Other medications: _____ Timing: _____

Other medications: _____ Timing: _____

MEALS AND SNACKS EATEN AT SCHOOL

Is student independent in carbohydrate calculations and management? ☐ Yes ☐ No

Meal/Snack	***Time***	***Carbohydrate servings/grams***
Breakfast	_____	_____
Mid-morning snack	_____	_____
Lunch	_____	_____
Mid-afternoon snack	_____	_____
Dinner	_____	_____

Snack before exercise? ☐ Yes ☐ No

Snack after exercise? ☐ Yes ☐ No

Other times to give snacks and content/amount: _____

Preferred snack foods: _____

Foods to avoid, if any: _____

Instructions for when food is provided to the class (e.g., as part of a class party or food sampling event):

_____

_____

EXERCISE AND SPORTS

A fast-acting carbohydrate such as _____ should be available at the site of exercise or sports.

Restrictions on activity, if any: _____

Student should not exercise if blood glucose level is below _____ mg/dl or above _____mg/dl or if moderate to large urine ketones are present.

HYPOGLYCEMIA (LOW BLOOD SUGAR)

Usual symptoms of hypoglycemia: _____

_____

Treatment of hypoglycemia: _____

_____

Has glucagon ever been administered? ☐ Yes ☐ No

Diabetes Health History Form and Management Planning Tool *(continued)*

HYPERGLYCEMIA (HIGH BLOOD SUGAR)

Usual symptoms of hyperglycemia: _____

_____

Treatment of hyperglycemia: _____

_____

Urine should be checked for ketones when blood glucose levels are above _____ mg/dl.

Treatment for ketones: _____

SUPPLIES TO BE KEPT AT SCHOOL

_____ Blood glucose meter, blood glucose test strips, batteries for meter
_____ Lancet device, lancets, gloves, etc.
_____ Urine ketone strips
_____ Insulin vials and syringes
_____ Insulin pump and supplies
_____ Insulin pen, pen needles, insulin cartridges
_____ Fast-acting source of glucose
_____ Carbohydrate containing snack
_____ Glucagon emergency kit

ACKNOWLEDGED AND REVIEWED WITH:

_____ _____
Student's Parent/Guardian Date

_____ _____
Student's Parent/Guardian Date

_____ _____
School Nurse Date

Draft

ABC PUBLIC SCHOOLS

HIPAA-Compliant Authorization for Exchange of Health & Education Information
-Sample-

Patient/ Name: _____ **Date of Birth**: _____

I hereby authorize _____ [*insert health care provider name & title*]

and _____ [*insert name & title of school official*] to exchange

health and education information/records for the purpose listed below.

_____ [*insert address & telephone of school/school district*]

_____ [*insert address and telephone of health care provider*]

Description:
The health information to be disclosed consists of:

The education information to be disclosed consists of:

Purpose: This information will be used for the following purpose(s):

1. Educational evaluation and program planning
2. Health assessment and planning for health care services and treatment in school
3. Medical evaluation and treatment
4. Other:_____

_____

Authorization

This authorization is valid for one calendar year. It will expire on _____[*insert date*]. I understand that I may revoke this authorization at any time by submitting written notice of the withdrawal of my consent. I recognize that health records, once received by the school district, may not be protected by the HIPAA Privacy Rule, but will become education records protected by the Family Educational Rights and Privacy Act. I also understand that if I refuse to sign, such refusal will not interfere with my child's ability to obtain health care.

_____

Parent Signature Date

_____

Student Signature* Date

*If a minor student is authorized to consent to health care without parental consent under federal or state law, only the student shall sign this authorization form. In Connecticut, a competent minor, depending on age, can consent to outpatient mental health care, alcohol and drug abuse treatment, testing for HIV/AIDS, and reproductive health care services.

Copies: Parent or student*
Physician or other health care provider releasing the protected health information
School official requesting/receiving the protected health information

PSA - Rev. 4/15/03

By Connecticut State Department of Education, Nadine Schwab, & Connecticut Chapter, American Academy of Pediatrics; adapted format from Ohio.

Draft

ABC PUBLIC SCHOOLS

HIPAA-Compliant Authorization for Release of Health Information
- Sample -

Patient/Student Name: _____ **Date of Birth**: _____

I hereby authorize _____ [*insert health care provider name, address and telephone*] to release my/my child's health information/records for the purpose listed below to:

_____ [*insert name of school official*]

_____ [*insert name of school/school district*]

_____ [*insert school address and telephone*]

Description:
The information to be disclosed consists of:

Purpose:
This information will be used for the following purpose(s):

Authorization

This authorization is valid for one calendar year. It will expire on _____[*insert date*]. I understand that I may revoke this authorization at any time by submitting written notice of the withdrawal of my consent. I recognize that these records, once received by the school district, may not be protected by the HIPAA Privacy Rule, but will become education records protected by the Family Educational Rights and Privacy Act. I also understand that if I refuse to sign, such refusal will not interfere with my child's ability to obtain health care.

_____

Parent Signature Date

_____

Student Signature* Date

*If a minor student is authorized to consent to health care without parental consent under federal or state law, only the student shall sign this authorization form. In Connecticut, a competent minor, depending on age, can consent to outpatient mental health care, alcohol and drug abuse treatment, testing for HIV/AIDS, and reproductive health care services.

Copies: Parent or student*
Physician or other health care provider releasing the protected health information
School official requesting/receiving the protected health information

PSA - Rev. 4/15/03

By Connecticut State Department of Education, Nadine Schwab, & Connecticut Chapter, American Academy of Pediatrics; adapted format from Ohio.

Prescription Medication Order and Permission to Administer Medication and to Test Blood Sugar Form

(*To be returned to the school nurse or designee)*

From time to time, it may be necessary for your child to take prescription medicine for treatment of an illness. Medicines that are ordered to be taken less than 4 times a day can and should be taken at home. However, if medicine must be taken 4 or more times a day, or at a specific time scheduled during school hours, the school nurse or designee, as mandated by state law, may dispense medications **ONLY WITH THE FOLLOWING:**

1. Medication order, signed by the physicians
2. Parental authorization, signed by the parent or guardian
3. Original pharmacist labeled bottle.

MEDICATION ORDER

Student: _____Date of Birth: ____/____/____
Medication: _____
Directions: _____
Reason for giving: _____
Date: ___/___/___ Telephone number of physician or health care provider: _____
_____
(Signature of Physician or Health Care Provider)

PERMISSION TO ADMINISTER

Date: ____/____/____ I hereby give my permission for _____to take the above prescription at school as directed.

_____
(Signature of Parent/Guardian)

PERMISSION TO TEST BLOOD SUGAR LEVEL

Date: ____/____/____ I grant permission for the school nurse or designee to test my child's blood sugar level at school during a crisis or emergency situation.

_____
(Signature of Parent/Guardian)

Date: ____/____/____ I grant permission for the school nurse or designee to test this child's blood sugar level during a crisis or emergency situation.

_____
(Signature of Physician or Health Care Provider)

Source: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses.

Sample Letter to Health Care Provider Regarding Health Care Plan

Date: _____

Dear _____(put applicable title – i.e., MD, DO, etc.)

The _____ school district has been asked to provide specialized health care for your patient _____.

If it is essential that this procedure be provided during school hours, we will need your written order on file.

Attached is a tentative health care plan for this student, including a description of a standardized procedure. Please review these materials, make written comments, and provide the requested information to guide us in providing a safe school environment. We will incorporate your comments and make adjustments in the procedure as directed. Services will begin when we have the necessary orders and adequately trained personnel in place.

Please feel free to contact _____, who is assuming the responsibility for the management of this student's health care in our school. She (he) can be reached at _____ (add best time to call, if this is pertinent).

Sincerely,

(Sample #1)

Emergency Action Plan
Diabetes Healthcare

Student's Name _____ _____ Grade _____

Address _____ Home Phone _____

Father/Guardian _____

Phone: Home_____ Work_____ Cell_____

Mother/Guardian _____

Phone: Home_____ Work_____ Cell_____

Other person to contact in an Emergency:
Name _____

Address _____

Phone: Home_____ Work_____ Cell_____

Hospital Preferred _____

Physician(s) or Health Care Provider's Name _____

Phone _____

Emergency items to be left at school:

Glucose tablets _____	Glucagon _____
Snacks _____	Blood glucose meter _____
Glucose Gel _____	Insulin _____
_____	Syringes _____
_____	Other _____

In the event of a low blood sugar response, the procedure routinely followed at school is: to give some form of sugar or carbohydrate, such as ½ carton of milk, ½ cup fruit juice, or ½ cup non diet soda, followed by crackers with cheese. If the student is unconscious, call 911.

I approve the above emergency healthcare action plan as written Yes ____ No____

Please make the following changes to the emergency healthcare action plan:

_____

_____

_____

_____

- (continued on back) -

(Sample #1 Continued)

Emergency Action Plan Diabetes Healthcare

List other additional information or significant special health concerns of this student.

_____
_____
_____
_____
_____
_____

I give permission for emergency blood glucose testing by the school nurse or designee using equipment I have provided. I understand that when the school nurse or designee is not available for emergency blood glucose testing, the parent/guardian will be notified or "911" will be called. Yes _____ No _____

_____

Additional directions regarding blood glucose testing: _____

_____
_____
_____

Written and submitted by: _____ _____
Nurse or Designee Date

Reviewed and signed: _____ _____
Parent/guardian Date

_____ _____
Student Date

_____ _____
Physican or Health Care Provider Date

To be reviewed _____
Date

The emergency healthcare action plan should be revised according to the child's specific needs, at least annually.

Source: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses. Sample of Springfield School District Emergency Action Plan – Diabetes Healthcare.

(Sample #2)

Health Services Department Emergency Plan DIABETES

In an emergency:

1) Stay with child.
2) Call/ask someone to call school _____ who will assess child and summon EMS if needed.

IF YOU SEE THIS:	**DO THIS:**
(Based on this child's current condition, a Medical Emergency for this child is:)	
IF student is not responsive (unconscious, having seizures, or is unable to swallow)	• **CALL 911**…Call Parents/Guardians • Don't attempt to give anything by mouth. • Position on side, if possible. • Contact school nurse or trained diabetes personnel. • Administer glucagon, as prescribed. • Stay with student.
IF student is non-responsive, but able to swallow	• Squirt _____ inside cheek closest to ground. • _____ is kept in _____. • Measure Blood Sugar with monitor (to be done by _____).
IF student is responsive	• Hypoglycemic (low blood sugar) reaction: IF Blood Sugar reading is _____ or below, then give _____. • Hyperglycemia (high blood sugar) reaction: Keep student walking or sitting and drinking water. • If Blood Sugar is >_____ mg/dl, student, school nurse or assigned person (identify:_____) should check urine for ketones.

IMPORTANT EMERGENCY NUMBERS:

_____ _____

_____ _____

_____ _____

Adapted from: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses. Sample from Lee's Summit School District.

Staff Training Record

Staff Member Name	*Date*	*Training Description**	*Signature of Trainer*	*Notes*

*Training Description (e.g., Diabetes Basics, Monitoring, Insulin and Glucagon, Diabetes Emergencies)

The following resources are appropriate for training school staff:

- The American Diabetes Association's curriculum "Diabetes Care Tasks at School: What Key Personnel Need to Know" which can be accessed at: http://www.diabetes.org/schooltraining.
- The National Diabetes Education Program (NDEP) school manual "Helping the Student with Diabetes Succeed: A Guide for School Personnel" Section 2, "Actions for School Personnel, Parents and Students", pages 32-46.

Blood Glucose and Insulin Procedures

_____ _____
(Name of Student) (Grade/Teacher)

_____ _____
(Name of Physician or Health Care Provider) (Contact telephone #)

_____

_____ _____ _____
(Name of Medication) (Dosage) (Time)

Medication must be dispensed following the School District Medication Policy.

RESPONSIBILITIES FOR MONITORING BLOOD GLUCOSE AND ADMINISTERING INSULIN:

OBSERVED

YES	NO	
____	____	Diabetes Checklist returned
____	____	Correct use of blood glucose monitor
____	____	Demonstrates knowledge of self-administration of insulin
____	____	Proper timing and documentation of monitoring blood glucose
____	____	Proper timing for administration of insulin
____	____	Demonstrates appropriate use of supplies
____	____	Follows appropriate method for disposal of supplies
____	____	Keeps treatment for low/high blood sugar with own belongings in case of a secondary student in his/her own locker
____	____	Agrees to seek assistance from school personnel as needed

The student (does/does not) demonstrate meeting the above specified responsibilities. The privilege of monitoring blood glucose and self-administration of insulin (will/will not) be allowed.

_____ _____ _____
(Student's Signature) (Date) (RN's Signature/Date)

Comments: _____

My child will be responsible for carrying this medication and will self-administer. My child agrees to follow the District's procedures concerning the handling and administration of this medication.

_____ _____
(Parent/Guardian's Signature) (Date)

Source: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses.

Expectations of the Student in Diabetes Care

"Children and youths should be able to implement their diabetes care in school with parental consent to the extent that is appropriate for the student's development and his or her experiences with diabetes" (*Diabetes Care*, 25:S122-S125, 2002 © 2002 by the American Diabetes Association). The "Blood Glucose and Insulin Procedures" form outlines what a student is capable of performing and how medication will be dispensed according to School District's Medication Policy.

Below is an outline of ages at which children should be able to perform self-care tasks.

1. *Preschool and day care.* The preschool child is usually unable to perform diabetes tasks independently. By 4 years of age, children may be expected to generally cooperate in diabetes tasks.

2. *Elementary school.* The child should be expected to cooperate in all diabetes tasks at school. By age 8 years, with supervision most children are able to perform their own fingerstick blood glucose tests. By age 10, with supervision some children can administer insulin.

3. *Middle school or junior high school.* The student should be able to administer insulin with supervision and perform self-monitoring of blood glucose when not experiencing a low blood glucose level.

4. *High school.* When not experiencing a low blood glucose level, the student should be able to perform self-monitoring of blood glucose. In high school, adolescents should be able to administer insulin without supervision.

Reminder – at any age, individuals with diabetes may require assistance to perform a blood glucose test when blood glucose is low.

Source: *"Diabetes Care" 25:S122-S125, 2002 © by the American Diabetes Association, Inc.*

HEALTH SERVICES
BLOOD GLUCOSE RECORD

Student _____ Date of Birth _____

Lunch time _____ P.E. time _____

A.M. Snack time _____ P.M. Snack time _____

DATE	TIME	BLOOD SUGAR	KETONES	NOTES

Source: “Diabetes Management in the School Setting”, 1998, Missouri Association of School Nurses.

504 Dietary Plan

Section 504 of the Rehabilitation Act of 1973 assures handicapped students access to school meal service, even if special meals are needed because of their handicap.

"Handicapped student" means any student who has a physical or mental impairment, which substantially limits one or more life activities, has a record of such an impairment, or is regarded as having such an impairment.

If special meals are needed and requested, certification from a medical doctor or health care provider must 1) verify that special meals are needed because of the handicap, and 2) prescribe the alternate foods and forms needed.

Completion of the following by a student's physician or health care provider will provide the necessary certification:

NAME OF STUDENT FOR WHOM SPECIAL MEALS ARE REQUESTED:

_____

Food Prescribed	Form Allowed (e.g. fresh, baked, ground, blended, etc.)
Meat & meat alternates	
Milk & milk products	
Bread & cereal	
Fruits & vegetables	

Other Dietary Information and Directions

I certify the above named student is in need of special school meals prepared from the above-indicated foods and forms because of a handicap.

_____ _____

Physician or Health Care Provider's Signature Date

Source: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses.

- Meal Plan Sample on Back –

Meal Plan Sample

Be sure to communicate with your food service manager to confirm the nutrition content of meals.

Meal Plan (Calories) _____ Date _____

Time	Number of Exchanges/Choices	Total Carbohydrate Grams
	___ Carbohydrate group _____ Starch* _____ Fruit _____ Vegetable _____ Milk _____ ___ Meat group _____ ___ Fat group _____	
	___ _____ ___ _____	
	___ Carbohydrate group _____ Starch* _____ Fruit _____ Vegetable _____ Milk _____ ___ Meat group _____ ___ Fat group _____	
	___ _____ ___ _____	
	___ Carbohydrate group _____ Starch* _____ Fruit _____ Vegetable _____ Milk _____ ___ Meat group _____ ___ Fat group _____	
	___ _____ ___ _____	

* Starches include grains (rice, bread, pasta, etc.), beans, starchy vegetables, and foods listed as "other carbohydrates" on the diabetes exchange lists.

The Joslin Diabetes Center at Harvard University has created web-based materials on carbohydrate counting. *"Carbohydrate Counting: As easy as 1-2-3"* can be accessed at:
http://www.joslin.harvard.edu/education/library/wcarbsug.shtml/

Individualized Health Plan (IHP) Sample

Assessment Data	Nursing Diagnosis	Goals	Nursing Interventions	Expected Outcomes
Student has frequent hypoglycemic and/or hyperglycemic events. Student has irregular blood glucose monitoring	Physiological injury due to development of acute complications related to hypoglycemic or ketoacidosis (NANDA 1.6.1) (Taxonomy II NANDA code 00035)	Student (parent) will recognize and treat early signs of insulin shock appropriately and know how to recognize and respond to early signs of ketoacidosis.	Interview student to determine typical low blood sugar symptoms. Evaluate if student understands his/her reaction symptoms in early stages.	The student will be successful in diabetes management in the school setting. The student will manage or have assistance managing low blood sugar episodes.
Student has frequent infections			Monitor blood glucose testing and recording, instruct and reinforce skills PRN.	The student will not experience ketoacidosis.
Student is skipping recommended snacks.			Instruct student in pathophysiology of diabetes at level the student is capable of understanding (age and development appropriate).	The student will perform or have assistance performing blood glucose tests.
			Monitor insulin administration if given at school. Instruct and reinforce skills PRN. Monitor diet adherence, reinforce and instruct PRN. Monitor snack supply.	The student will maintain blood sugar within acceptable range.

Igoe, J., ed. *The School Nurse's Source Book of Individualized Healthcare Plans Volume1*. North Branch, MN, 1993. A complete care plan is available from Sunrise River Press, 39966 Grand Avenue, North Branch, MN 55056, 800-895-4585.
NANDA Nursing Diagnoses: Definitions and Classifications (2001-2002). North American Nursing Diagnosis Association, Philadelphia. Gordon M, Avant K, Herdman H, Hoskins L, Lavin MA, Sparks S, Warren J, Editorial Committee.

Individualized Health Plan (IHP) Sample

Assessment Data	Nursing Diagnosis	Goals	Nursing Interventions	Expected Outcomes
			Instruct student in meaning of glucose levels and appropriate action required at levels 40-300.	
			Arrange space and time for student to perform self-care activities. Assess student and teacher(s) level of understanding diabetes. Instruct PRN at appropriate level of understanding.	
			Instruct student and teacher(s) in what to do when early low blood sugar symptoms begin.	
			Develop individual emergency plan for (with) student and share with faculty (including plan for administration of glucagons PRN).	
			Support student and family in adaptation to diabetes.	

Igoe, J., ed. *The School Nurse's Source Book of Individualized Healthcare Plans Volume1*. North Branch, MN, 1993. A complete care plan is available from Sunrise River Press, 39966 Grand Avenue, North Branch, MN 55056, 800-895-4585.
NANDA Nursing Diagnoses: Definitions and Classifications (2001-2002). North American Nursing Diagnosis Association, Philadelphia. Gordon M, Avant K, Herdman H, Hoskins L, Lavin MA, Sparks S, Warren J, Editorial Committee.

Individualized Health Plan (IHP) Sample

Assessment Data	Nursing Diagnosis	Goals	Nursing Interventions	Expected Outcomes
Student displays lack of knowledge regarding medication, diet, blood sugar monitoring and exercise.	Knowledge deficit related to: oral hypoglycemic medication, insulin administration, dietary regimen, exercise requirements, blood sugar monitoring and/or balance of insulin, diet and exercise. (NANDA 8.1.1) (Taxonomy II NANDA code 000126)	Student will increase understanding of pathophysiology of diabetes and develop or improve the skills necessary to manage self.	Instruct student in pathophysiology of diabetes at level the student is capable of understanding (age and development appropriate).	The student will be successful in diabetes management in the school setting.
			Monitor insulin administration if given at school. Instruct and reinforce skills PRN.	The student will demonstrate increased knowledge and skill in medication management.
			Monitor diet adherence, reinforce and instruct PRN.	The student will demonstrate increased knowledge and skill in diet management.
			Instruct student in weight management, monitor weight regularly with student.	

Igoe, J., ed. *The School Nurse's Source Book of Individualized Healthcare Plans Volume1*. North Branch, MN, 1993. A complete care plan is available from Sunrise River Press, 39966 Grand Avenue, North Branch, MN 55056, 800-895-4585.
NANDA Nursing Diagnoses: Definitions and Classifications (2001-2002). North American Nursing Diagnosis Association, Philadelphia. Gordon M, Avant K, Herdman H, Hoskins L, Lavin MA, Sparks S, Warren J, Editorial Committee.

Individualized Health Plan (IHP) Sample

Assessment Data	Nursing Diagnosis	Goals	Nursing Interventions	Expected Outcomes
			Instruct student in meaning of glucose levels and appropriate action required at levels 40-300.	The student will perform or have assistance performing blood glucose tests.
			Arrange space and time for student to perform self-care activities.	
			Provide reinforcement and praise follow-through for self-management abilities.	

Igoe, J., ed. *The School Nurse's Source Book of Individualized Healthcare Plans Volume1*. North Branch, MN, 1993. A complete care plan is available from Sunrise River Press, 39966 Grand Avenue, North Branch, MN 55056, 800-895-4585.
NANDA Nursing Diagnoses: Definitions and Classifications (2001-2002). North American Nursing Diagnosis Association, Philadelphia. Gordon M, Avant K, Herdman H, Hoskins L, Lavin MA, Sparks S, Warren J, Editorial Committee.

Individualized Health Plan (IHP) Form

Assessment Data	Nursing Diagnosis	Goals	Nursing Interventions	Expected Outcomes

Special Health Care Needs: Administrative Guidelines

INTRODUCTION

The demand for school nursing services has increased in recent years because of increasing numbers of students with special health care needs. This influx has occurred, in part, due to the following changes:

- Advanced medical technology has led to improved survival rates and longer life spans of children with special health care needs.
- Hospitals are discharging children earlier to home and to school while they are still receiving treatment.
- There is a growing trend toward placement of children with severe disabilities in integrated community settings, including their homes or specialized foster parent homes, rather than in institutions.

As a result, special procedures requiring nursing skills such as suctioning trache-ostomies, catheterizations, and others are now being requested in the schools—an educational setting, not a medical setting.

These trends are supported by federal statutes, which pertain to the treatment of children with disabilities. Section 504 of the Rehabilitation Act of 1973 prohibits discrimination against children with handicapping conditions, or children who are regarded as handicapped, by recipients of federal funds. School districts must make reasonable accommodations to make their programs and services available to such children. Section 504 provisions are important because the definitions of children with handicapping conditions is broader than the definition of such children under Public Law 94-142, now known as Individuals with Disabilities Education Act (IDEA). Thus, a child may be eligible for certain services under Section 504, but not be eligible for special education under IDEA. Section 504 does not require an Individual Education Program (IEP) but does require a written plan. (See Appendix F.1 for *Sample Accommodation Form* on page 40.) It is recommended that the district document that a group of individuals familiar with the student's needs met and identified the needed services.

IDEA is the second federal statute that pertains to the issue of school health services. This statute requires local school districts to provide a "free appropriate public education" for eligible children through the provision of special education and related services. Related services have been defined by regulation and by court decisions to include school health services. Criteria for required services include:

1. Can be learned in a reasonable amount of time.
2. Should not require the presence of a physician, medical judgment from extensive medical training, or an undue amount of time to perform.
3. Must be provided or performed during the school day for the pupil to attend school or benefit from his/her educational program.
4. Must be ordered by a licensed physician or surgeon.

The variety of procedures described in these guidelines would clearly be included in the definition of school health services under IDEA; and therefore, may be the responsibility of school districts to provide when they are determined to be necessary for a child with a disability to benefit from the special education program, as determined by the Individual Education Program (IEP).

Quality health care is in the best interest and safety of the students and supports the optimal educational experience. This health care is best provided in the school through assessment, planning and monitoring by a registered nurse, in collaboration with the student's primary physician. Districts enrolling students with complex medical conditions must have access to this type of health care management in order to safely provide for the student's special needs.

Purpose

These administrative guidelines have been developed in order to assist school districts who serve students with complex medical conditions in making informed decisions regarding the delivery of health services at the school. Students with complex medical conditions may be medically unstable, have unpredictable responses to medication or treatment, may need care requiring professional judgment to modify a necessary procedure, or require medication at school. This type of care should be managed by a registered nurse and may include activities that cannot be delegated. Students with non-complex medical conditions may require procedures that can be performed safely as outlined in specific procedural guidelines, with no need for alterations requiring medical judgment. This type of care could be delegated to properly trained personnel. (See Appendix C.1 for the *National Association of School Nurses Position Statement on Case Management of Children With Special Health Care Needs* on pages 29-30 and Appendix C.2 for the *National Association of School Nurses Position Statement on School Nurse Role in Care and Management of the Child With Diabetes in the School Setting* on pages 31-32.)

Determination of Services Required

Districts without school nursing services should consider contracting with the local community health nurse to provide assessment, determine required services, and identify who can safely provide the care. This determination is based on the nurse's evaluation of a number of variables specific to each student. These variables include, but are not limited to:

- Number of medications, action, dosage, side effects of each drug, and route of administration.
- Utilization of medication on an as-needed basis (PRN).
- Nature, frequency, and complexity of prescribed treatments the student requires and the assessment needed for PRN treatments.
- Complexity and acuteness of the observations and judgments the caregiver must make.
- Stability of the student's medical condition, i.e., can the student's condition change dramatically to life threatening within a few seconds/minutes?
- Current specialized knowledge base and proficiency of psychomotor skill required by the proposed caregiver.
- Specific student's ability to communicate his/her needs to the caregiver.
- Level of preparation and experience of the designated direct caregiver.

Identification of Care Providers

A *Technical Skills Chart* (See Appendix F.2 on pages 41a-h) will assist school districts in clarifying the roles of the school nurse and other school personnel who might be directly involved in providing the health care requested in the school setting.

School districts without the services of a registered nurse should use the Technical Skills Chart in determining what additional personnel would be needed to safely provide for the care of a student with special needs. Special care procedures also include the administration of medication. Factors to be considered when determining who can safely provide these services include:

- Stability of student's condition.
- Complexity of task.
- Level of judgment and skill needed to safely alter the standard procedure in accordance with the needs of the student.
- Level of judgment required to determine how to proceed from one step to the next.

Competencies of Personnel

The registered nurse should take the responsibility to determine who is competent to provide needed care. See Appendix F.3 on pages 42-43 for a description of the competencies recommended for different levels of personnel. The delegation and supervision by registered nurses of unlicensed assistive personnel (UAP) assisting with the student's care is a major concern and is controlled by the Missouri State Board of Nursing and the Board of Healing Arts. The Technical Skills Chart indicates those procedures which should never be delegated. The registered nurse, by law, can perform those procedures for which she has the skill and education. In some of the more complex tasks, there will need to be training for the registered nurse provided by a physician, clinical nurse specialist from the tertiary care center, and parents/guardian. Parent(s)/guardian(s) have learned to perform the procedures required by their child and take the responsibility for their care 24 hours a day. They should be involved in the selection and training of school personnel to whom this care is delegated, indicate that they understand who will perform the procedure and be satisfied with the mastery of the care provider. (See Appendix C.3 for the *National Association of School Nurses Position Statement on Using Assistive Personnel in School Health Services Programs* on pages 33-34, Appendix C. 4 for the *Missouri State Board of Nursing Position Statement on Utilization of Unlicensed Health Care Personnel* on page 35, Appendix C.5 for *The National Association of State School Nurse Consultants, Inc. Position Statement on Delegation of School Health Services* on pages 36-37 and Appendix C.6 for the *National Association of School Nurses Position Statement on Delegation* on pages 38-39.)

Documentation of Plan of Care

It is essential to have a "Health Care Plan" for students with significant special needs. (See Appendix F.4 for a *Sample Individualized Health Care Action Form* on pages 44a-d) This plan serves as a written agreement with the student's parent(s)/guardian(s), health care provider, and school personnel and outlines how the district intends to meet the student's health care needs. This plan is different from the Individualized Health Care Plan designed for nursing intervention. The Action Plan provides for effective and efficient planning and protects both the student and

school personnel. Components of the Health Care Action Plan should include:

- Pertinent information about the student, i.e., names of parent(s)/guardian(s), addresses and phone number(s).
- List of key personnel, both primary care providers and school personnel.
- Emergency information.
- Emergency plan (potential child-specific emergencies).
- Background information, i.e., medical history, summary of home assessment, self care, family and life style factors, baseline health status, required medications and diet, and transportation needs.
- Licensed health care provider's order for medications, treatments or procedures.
- Parent(s)/guardian(s) authorization for specialized health care.
- Plan for specific procedures, with list of possible problems.
- Daily log for procedures.
- Documentation of training, if procedures are delegated.

Students who are in special education and have an IEP should have their Health Care Action Plan referenced in the IEP, and components may be incorporated in the IEP if there are services or learning needs that are appropriate for inclusion.

Emergency Plan

The needs of a technology-dependent child may require that written protocols be developed to address possible medical emergencies the student may experience while in the school setting. These protocols will be part of the Health Care Action Plan. The protocols would include:

- Definition of a medical emergency for this child.
- List of individuals to be notified when the emergency occurs.
- Identification of person who will initiate and direct the action to be taken.
- Specific action to be taken in this emergency.
- Transportation procedures.

These student-specific emergency plans should be shared with teaching staff and other school personnel, including ancillary staff such as cafeteria workers, custodians, and bus drivers. (See Appendix F.5 for *Sample Emergency Plan Form* on page 45). If the student is transported, specific training and plans should be provided to bus driver (See Appendix F.6 for *Sample Transportation Plan for Student With Special Health Care Needs* on pages 46-47).

Guidelines for Developing Health Care Action Plans

Purpose

Enrollment of students with special health care needs in the school setting presents a challenge to students, families and school staff. Development of a health care action plan provides for effective and efficient delivery of services that promote school success for the student and reduces the liability of the school district.

Responsibilities

A. Parent/Guardian

The parent/guardian has the most information regarding the unique needs of their child and they should play a major role in the development of the health care action plan. This role includes:

1. Being an advocate for their child.
2. Providing access to health care providers for information and orders for the medications and treatments, as necessary.
3. Participating in the identification and training of providers in the school setting for child-specific procedures.
4. Approval of the health care and emergency plans.
5. Notifying the school nurse of changes in the student's condition, health care providers or health care needs.

B. *Administrator*

1. Review the appropriate health and education assessment to determine the needs of the student in the school setting.
2. Provides adequate staffing to address the student's education, transportation, and health needs.
3. Provides time and support for training of registered nurses and other staff, as necessary.
4. Informs the Director of Transportation of the student and potential needs for health care. Provides a copy of the Emergency Plan and arranges for any needed in-service.
5. Manages potential environmental concerns such as:

    - Informing all personnel, including lunchroom and playground staff, of potential environmental concerns.
    - Special equipment needs, such as a wheelchair ramp.
    - Extermination of insects to safeguard students from possible insect bites and stings.
    - Emergency power supply for life-sustaining equipment.
    - Appropriate outlets for health care equipment.

6. Knows the potential need for available emergency medical services.

    - Local emergency unit – level of training.
    - Response time.
    - Cost of transportation.

- Flight rescue available – cost, time from hospital.

7. Communicates with parent(s)/guardian(s):

   - Need to participate in developing plan, expressing concerns.
   - Expected costs and who will be responsible.
   - Ensures parent(s)/ guardian(s) have supplied the necessary emergency information.

C. *School Nurse*

1. Reviews emergency and/or health information and determines which students will require a health care action plan.
2. Obtains significant health data on identified students.
3. Completes a nursing assessment and summarizes data. This data base should include:

   - Age of student at onset of condition.
   - Description of condition/course of illness.
   - Summary of treatment.
   - Other significant illness, allergies.
   - Date last seen by primary health care provider for noted condition.
   - Name, address, and phone numbers for care provider.
   - Significant emergency information for the Emergency Plan:

     a) What constitutes a medical emergency for this student?
     b) Preferred hospital.
     c) What orders, supplies or medications are needed for this medical emergency?

   - Health care procedures including:
     a) Orders for medication and treatment.
     b) Identification of care provider.
     c) Needed equipment.
     d) Responsibility for maintenance of equipment. (See Appendix F.7 for *Care of Equipment Form* on pages 48-49.)

4. Secures signed release of confidential information for all sources of significant medical information.
5. Develops and implements the health care action plan to be carried out at school. This plan should include situations that might arise while the student is on the bus, on field trips, during safety drills, and in the event of a disaster. This plan should include the following components:
   - Student identification data and date of plan.
   - Description of the health condition and possible effects on this student. If multiple problems exist, list each as a separate problem in the action plan.
   - General guidelines for determining action.
   - Procedures to be followed.
   - School personnel to be trained in child-specific procedures and problem management.

- Typed plan, signed by nurse, parent(s)/ guardian(s), and administrator.

6. Sends Health Care Plan to physician for review and comments. (See Appendix F.8 for *Sample Letter to Physician Regarding Health Care Plan* on page 50.)
7. Files health care plan in student's record and notes on emergency card that a health care action plan is on file.

This information was taken from the:

Manual for School Health Programs, May 2000, Missouri Department of Elementary and Secondary Education in cooperation with the Missouri Department of Health & Senior Services.

To review the complete manual, visit their website at:
http://www.dese.state.mo.us/divimprove/curriculum/hp/manualshlhealth/manualindex.html

Appendix C.1

National Association of School Nurses

Position Statement

Case Management of Children With Special Health Care Needs

HISTORY:

Both the historic and contemporary role of the school nurse has included case management for children with special health needs. Delivery of health care in the school setting requires the coordination of multiple health and non-health related services. The school nurse has the knowledge, skills, judgment, and critical thinking inherent in nursing education and authorized through nursing licensure to perform efficiently in the role as case manager.

DESCRIPTION OF ISSUE:

In 1975, legislation was passed that mandated all children, including those with special health care needs, be educated with their peers. Since then, children with more and more complex health care needs have been attending schools throughout the United States (Gelfman, 2001; Gelfman & Schwab, 2001). A partnership among health care providers, students, their families and the school system is essential to provide a smooth transition from home or hospital to school. To enhance this collaborative effort, it is essential for a school-based care manager to oversee the care provided on a case-by-case basis. The school nurse is the logical person to provide this oversight in the school setting, ensuring that the student has access to optimal health and educational success.

RATIONALE:

Case management is intrinsic to the school nurse's job. School nurses function in the roles of community liaison, health and illness information interpreter to school personnel, direct and indirect care provider, student advocate, and educator to students, families, and school personnel. The school nurse is often the only person in the school setting with medical knowledge about the implications of a child's health status, knowledge of existing health care resources in the community, and understanding of how to access needed health services. The school nurse also has knowledge about the school environment and its potential barriers and facilitators to delivering health services and the provision for optimal educational opportunities.

CONCLUSION:

Case management of children with special health care needs involves various activities designed to ensure the health and educational success of the child at school. It is the position of the National Association of School Nurses that the school nurse has the knowledge, experience and authority to be the case manager for children with special health care needs. This includes, but is not limited to, the following:

- Being knowledgeable about the services needed by students with special health care needs after collaboration with the student, family and health care provider
- Being knowledgeable about services available in the community and assisting families in obtaining needed services
- Screening for students who would qualify and benefit from case management services for their health care needs
- Providing leadership in interdisciplinary team meetings to assist in planning needed services to meet the health and educational needs of the students
- Implementing the health team's plan of care, by providing either direct or indirect care
- Coordinating continuity of care between home and the school

- Monitoring and evaluating interventions and implementation of the health care plan
- Monitoring and evaluating progress toward identified health and educational goals
- Training, monitoring, and evaluating personnel delegated to perform specific nursing care

A case management team is essential in ensuring care is provided in a coordinated and effective manner for students with special health care needs. The school nurse must assume the leadership position as case manager in this process. The school nurse, in the role of case manager, provides oversight of care and services and serves as the point of contact for communication among the student, family, school staff, and health care provider.

Reference/Resources:

1. Barrett, J.C. (2002). A school-based care management service for children with special needs. Family and Community Health, 23(2), 36-42.
2. Bednarz, P.K. (1998). The Omaha system: A model for describing school nurse case management. Journal of School Nursing, 14(3), 24-30.
3. Gelfman, M. (2001). Special education law. In N. Schwab & M. Gelfman (Eds.), Legal issues in school health services: A resource for school administrators, school attorneys, school nurses (pp. 373-397). North Branch, MN: Sunrise River Press.
4. Gelfman, M. & Schwab, N. (2001). Discrimination in schools: Section 504, ADA, and Title IX. In N. Schwab & M. Gelfman (Eds.), Legal issues in school health services: A resource for school administrators, school attorneys, school nurses (pp. 335-371). North Branch, MN: Sunrise River Press.
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6. National Association of School Nurses & American Nurses Association (2001). Scope and standards of professional school nursing practice. Washington DC: American Nurses Publishing.
7. Perry, C.S. & Toole, K.A. (2000). Health service applications: Impact of school nurse case management on asthma control in school-aged children. Journal of School Health, 70(7), 303-304.
8. Smith, A. J., Armijo, E. J. & Stowitschek, J. J. (1997). Current applications of case management in schools to improve children's readiness to learn. Journal of Case Management, 6(3), 105-113.

Adopted: June 1995
Revised: October 2002

Appendix C.2

National Association of School Nurses

Position Statement

School Nurse Role in Care and Management of the Child With Diabetes in the School Setting

HISTORY:

Diabetes is a common chronic disease of childhood, and most children with diabetes attend school and/or daycare. About 1.7 per 1000 children under age 20 have type 1 diabetes; and about 13,000 new cases of type 1 are diagnosed annually. In addition, children are now being diagnosed with type 2 diabetes, a disease once found only among adults. The reasons for this alarming increase appear to be linked to the rise in childhood obesity and the decline in physical activity. Still, not all people with type 2 diabetes are overweight. At risk populations for type 2 diabetes include African Americans, Native Americans, Hispanic Americans, and Asian Americans.

DESCRIPTION OF ISSUE:

Each student with diabetes is unique in regard to his or her disease process, developmental and intellectual abilities, and levels of assistance required for disease management. Schools must ensure full participation in academics and provide a safe environment for all students. The student with diabetes presents several variables that could be barriers to full participation if not fully addressed.

The goal of diabetes medical management is to maintain blood glucose levels at or near normal range. Poor or insufficient medical management of diabetes allows fluctuating levels of blood glucose. This fluctuation can lead to immediate consequences in the classroom as well as long-term complications such as damage to the eyes, kidneys, nerves, gums, and blood vessels. Low glucose levels can cause immediate concern with symptoms of pallor, diaphoresis, and a decrease in cognition. If not treated immediately low glucose levels can progress to unconsciousness and death. Despite a quick and favorable response to treatment for a low glucose episode, cognitive ability can remain impaired for several hours. High glucose levels may also present a medical risk to students in the school setting.

To achieve the goal of optimal diabetes medical management the student may need access to a variety of diabetes supplies and may need to perform multiple tasks during the school day. Management strategies for a student with diabetes should be developed considering the knowledge base of the student, developmentally appropriate tasks, the availability of professional staff, and the logistics of the school building. In addition, the student must have access to glucose monitoring equipment, oral or injectable medications including insulin and glucagon, nutritional supplements such as snacks and a fast acting source of glucose, knowledge of the equipment used in their diabetes management (syringes, insulin pen, insulin pump, etc.), a documentation system for blood glucose readings and insulin dosage, and access to a bathroom. A goal of allowing the student to self-manage his or her disease following an individually prescribed regimen in a seamless unrestricted fashion between home and schools is critical to maintaining near normal blood glucose levels.

Knowledgeable personnel must be available at all times including during extra curricular activities and field trips to assist students in managing their diabetes and to respond to emergencies. By having personnel available, medical, academic, and/or behavioral consequences of poor blood glucose control evident in the classroom as well as long-term health effects can be minimized or avoided.

RATIONALE:

Both high and low blood glucose levels affect the student's ability to learn and endanger the student's health. Glucose levels should be as close to the desired range as possible for optimal learning and testing of academic skills. Recent research indicates that maintaining the glucose levels within a narrow range can prevent, reduce, and/or reverse long-term complications of diabetes. The school nurse, as a skilled professional, is in a unique position to provide early identification of children who exhibit symptoms of diabetes and initiate the referral process.

Managing diabetes at school is most effective when the entire school community is involved – school nurses, teachers, counselors, coaches, parents, medical home, and students. The school nurse can provide the coordination needed to elicit cooperation from the school community in assisting the student with diabetes toward self-management of diabetes. The school nurse can be instrumental in preventing and managing emergency conditions that can result from glucose fluctuations by instructing the entire school team on basic diabetes information and management. Emergency conditions are not necessarily the result of a lack of management. Factors such as illness, hormones, or stress may cause a student who closely follows a prescribed regimen to experience an emergency situation. The student with diabetes requires the professional supervision of the school nurse to enhance their self-care skills.

CONCLUSION:

It is the position of the National Association of School Nurses that school nurses have the professional skills needed to assess and support the child with diabetes in the school setting. School nurses are uniquely prepared to provide information to the multidisciplinary team to develop a 504 Plan or Individual Education Plan/Individual Family Service Plan (IEP/IFSP). The school nurse is the key person to implement this plan. While a 504 or IEP/ IFSP diabetes health plan may take into consideration management strategies preferred by the student, their family and medical home, it must also conform to state and federal guidelines, as well as the state nurse practice act and the related rules for delegation.

Further, it is the position of the National Association of School Nurses that schools have a basic duty to ensure that the medical needs of students are addressed in the school setting. Under the direction of the school nurse, management strategies may be incorporated in a seamless fashion between home and classroom to help the student with diabetes stay healthy, be academically focused and participate in all desired academic and extra curricular activities.

References/Resources:

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Adopted: November 2001

Appendix C.3

National Association of School Nurses

Position Statement

Using Assistive Personnel in School Health Services Programs

HISTORY:

The health-related needs of students are intensifying in our nation's schools. Student safety is the primary concern in determining whether or how assistants should be used to help professional school nurses to deliver increasingly needed health services to students.

DESCRIPTION OF ISSUE:

Assistive personnel serve as school nurse extenders by supporting the nurse in the health office, performing clerical functions, and carrying out certain delegated nursing activities on behalf of students. State Nurse Practice Acts and regulations promulgated pursuant to practice acts determine the scope of nursing practice and what nursing activities can be delegated or given to assistive personnel. People employed by the school district may have partial or total responsibility for assisting licensed, registered professional school nurses. These support staff include: unlicensed assistive personnel (UAP), such as school staff, clerical aides, and health/nursing assistants or aides (HA); licensed paraprofessionals, known as licensed practical nurses (LPN) or licensed vocational nurses (LVN); and registered nurses (RN) who do not meet their state's or school district's requirements for qualification as a school nurse. Each type of support staff has unique qualities and limitations as described below:

1. School staff whose job is to deliver, support, or manage education are the least qualified to assist the school nurse in providing physical health care to students. They lack health-specific training, and their job focus may not allow them to devote the care and attention needed to safely deliver health services.
2. Clerical aides who only provide clerical support to the health services program should not be expected to provide direct student health care. They require supervision by the school nurse; and in addition to general clerical training, they will need on-the-job training in such areas as school records management and confidentiality.
3. HAs, at minimum, should have a high school diploma, current certification in CPR and first aid, and on-the-job-training in such subjects as confidentiality and infection control. If the state requires a specified curriculum or certification for nursing/health assistants, HAs in schools must also meet these state regulations. Under virtually all state nurse practice acts, RNs are responsible for directing, delegating to, and supervising these UAPs.
4. LPNs and LVNs usually complete a 12-month course of study beyond high school and pass state licensure, which allows them to practice on a technical level of nursing. LPNs and LVNs can contribute to each step of the nursing process, but cannot independently assess the health status of any student or the student's environment, make a nursing diagnosis, develop the plan of care, or determine when delegation of care to a UAP is appropriate. They work in a team relationship with the registered professional school nurse. Although states may vary in both scope of practice and degree of supervision needed, virtually all state nurse practice acts require that a RN supervise these technical nurses.
5. RNs who do not meet the education and experience qualifications stipulated by the state's department of education or the school district to work as school nurses are nonetheless licensed by the state's board of nursing to practice nursing independently. The school nurse should be responsible for evaluating the outcomes of nursing services for all students, making suitable assignments to the RN, and providing supervision appropriate to the situation.

Key factors for effective and competent use of assistive personnel are role definition, adequacy of training, and appropriate delegation and supervision. School nurses, in collaboration with school and district administration, should develop clear, limited, written practice descriptions and then ensure adequate training and competency to perform identified tasks. Assistive personnel may not be required to make clinical assessments or nursing judgments or to implement nursing tasks requiring licensure. There should be written protocols for handling specific student health issues, with directions for particular signs and symptoms that must be reported to the school nurse. When the school nurse delegates responsibilities, the nurse must be available to provide direction,

supervision, and immediate intervention in a situation as needed. State law, regulations, standards, and rules set by state boards of nursing may determine whether off-site supervision of assistive personnel by RNs is an option. If state-permitted, the school nurse determines when off-site supervision is safe and how frequently on-site supervision is indicated.

It is important that the following issues are considered when using assistive personnel in schools:

- State nurse practice acts, including but not limited to scope of practice and to licensure, delegation, and supervisory responsibilities of RNs in relationship to LPN/LVNs and to certified or registered nursing assistants
- School nurse certification requirements under state education statutes and regulation
- Scope and standards of school nursing practice
- School district job descriptions that are legally appropriate to the level of preparation, expectations, and experience of the assistive personnel
- State and NASN staffing guidelines that consider various safe staffing mixes in relation to the health needs of the student population

RATIONALE:

The use of assistive personnel can extend the delivery of health services, but when used to replace professional health care providers, it leads to reduced quality of care to students. For staffing or budgetary reasons, assistive personnel are a necessary adjunct to many school health services programs; and if properly trained and supervised, they can enhance services to students and increase the cost-effectiveness of the program. Staffing decisions must be based on the assistive services needed, scope of practice, competencies, the RNs legal relationship to the assistant, and the amount of time required for on- and off-site supervision. Improved staffing of health services programs seems to result in healthier children who attend school and are more available for learning. While the use of assistive personnel may be an acceptable alternative to enhance this staffing, their improper use cannot only compromise students' quality of care, but also create liability for the district and/or nurse.

CONCLUSION:

It is the position of the National Association of School Nurses that the use of assistive personnel may be appropriate to supplement professional school nursing services in certain situations, but they should never supplant school nurses nor be permitted to practice nursing without a license. The professional school nurse should take the lead in helping school districts appropriately determine whether and how to use assistive health personnel. The school nurse is the only one who is trained and capable of assessing the health needs of the student population and the only one who can legally delegate nursing activities to unlicensed persons. Appropriate nurse to assistant ratios and on-site supervision are essential for ensuring safe delivery of nursing services to students.

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Appendix C.4

Missouri State Board of Nursing

Position Statement

Utilization Of Unlicensed Health Care Personnel

The mission of the Missouri State Board of Nursing is to assure safe and effective nursing care in the interest of public protection. The Board of Nursing has the legal responsibility to regulate nursing and provide guidance regarding the utilization of unlicensed health care personnel. The Board acknowledges that there is a need and a place for competent, appropriately supervised unlicensed health care personnel to assist, but not replace, licensed nurses.

Unlicensed health care personnel who perform specific nursing tasks without benefit of instruction, delegation, and supervision by licensed nurses may be engaged in the practice of nursing without a license. Such actions by unlicensed health care personnel are a violation of the Missouri Nursing Practice Act [335.066 (10), RSMo]. Unlicensed health care personnel remain personally accountable for their own actions.

The Missouri Board of Nursing recognizes that activities of unlicensed health care personnel need to be monitored to protect the health, welfare and safety of the public. Registered professional nurses may teach, delegate, and supervise licensed practical nurses and unlicensed health care personnel in the performance of certain nursing care tasks [335.016 (9)(e), RSMo; 4 CSR 200-5.010 Definitions]. Under the direction/supervision of registered professional nurses or persons licensed by a state regulatory board to prescribe medications and treatments, licensed practical nurses may teach, delegate, and supervise unlicensed health care personnel in the performance of specific nursing care tasks [335.016 (8), RSMo; 4 CSR 200-5.010 Definitions].

Registered professional nurses and licensed practical nurses must make reasonable and prudent judgements regarding the appropriateness of delegated selected nursing care tasks to unlicensed health care workers. Licensed nurses must ensure that unlicensed health care personnel have documented, demonstrated evidence of appropriate education, training, skills, and experience to accomplish the task safely. Carrying out responsible and accountable supervisory behavior after specific nursing tasks are delegated to unlicensed health care personnel is critical to the health, welfare, and safety of patients [335.016 (9)(e), RSMo; 4 CSR 200-5.010 Definitions]. Licensed nurses who delegate retain accountability for the tasks delegated.

To assist licensed nurses to competently perform critical processes involved in delegating, the Missouri State Board of Nursing subscribes to the use of the National Council of State Boards of Nursing's concept paper on delegation and delegation decision-making tree available at the National Council of State Boards of Nursing's web site address: http://www.ncsbn.org/public/regulation/delegation.htm.

Revised 3/3/99

Appendix C.5

The National Association of State School Nurse Consultants, Inc.

Position Statement

Delegation of School Health Services

POSITION

The National Association of State School Nurse Consultants (NASSNC) recognizes that:

- School nursing services are essential for the health, rehabilitation and well being of the student population in order for them to benefit from educational programs and to maximize energy for learning;
- Both the volume and range of nursing services that must be provided at schools has increased dramatically over the past decade.

As a result, certain aspects of student care may need to be delegated to licensed practical nurses (LPNs) or unlicensed assistive personnel (UAPs). In order to ensure quality and the safe provision of services as necessary for students with health and nursing care needs, NASSNC believes these services should either be directly provided by school nurses who are licensed registered nurses (RNs) and or delegated by the RN to qualified paraprofessionals or unlicensed assistive personnel (UAPs) in accordance with the state nurse practice act. The RN must determine which student care activities may be delegated, under what circumstances it is appropriate to delegate aspects of student care, and by whom the delegated portions of care can safely be provided. The RN is responsible for the assessing, planning, training, supervising, and evaluation of the unlicensed assistive personnel (UAPs).

RATIONALE

More students with special health care needs are now attending school and placing new demands on school districts. As a result, local school boards must provide sufficient staff and resources to safely meet the needs of students with chronic or urgent health care needs by providing a level of school health nursing services previously not required. Ancillary staff may be useful in some settings in meeting these growing needs. However, safe care for students must be the priority. When all or a certain part of a student's nursing care is delegated by a RN, the performance of the activity or procedure is transferred to another person, but the RN retains the accountability for the outcome. This is similar to the assignment of certain tasks to a classroom assistant while the teacher retains responsibility for the learning outcome.

School administrators are legally responsible for the safety of all students, including the provision of required health services by qualified staff. They have certain responsibilities regarding the educational placement of students but they cannot legally be responsible for deciding the level of nursing care required by an individual student with special health care needs. The RN, based on his or her knowledge, and in accordance with the state's nurse practice act and related state rules and regulations, is responsible for determining whether care should be provided by a licensed nurse or delegated to a trained and supervised unlicensed assistive personnel. Use of non-qualified school staff risks harm to students. In addition, non-licensed school staff can be held liable for their actions if they practice nursing or medicine without a license authorizing such practice.

By professional and legal mandate, RNs are ultimately responsible for the quality of nursing they provide and are personally and professionally liable for all errors in nursing judgment. If the RN's actions violate the requirements of the nurse practice act, the state board of nursing can take disciplinary action against the RN, including revocation of his/her license to practice nursing.

DEFINITIONS

Delegation "the transfer of responsibility for the performance of an activity from one individual to another, with the former retaining accountability for the outcome" (American Nurses' Association (ANA), 1994, p. 11).

Licensed Practical Nurse (LPN) or Licensed Vocational Nurse (LVN): minimal educational preparation: graduate of a technical program, licensed by the state.

Unlicensed assistive personnel (UAP): "individuals who are trained to function in an assistive role to the registered professional nurse in the provision of [student] care activities as delegated by and under the supervision of the registered professional nurse" (ANA, 1994, p. 2).

Qualified School Nurse: "a registered nurse (RN), minimum educational preparation: Baccalaureate Science in Nursing (BSN), licensed by the state. National certification preferred. School nursing is a specialized practice of professional nursing that advances the well being, academic success, and life long achievement of students. To that end, school nurses facilitate positive student responses to normal development; promote health and safety; intervene with actual and potential health problems; provide case management services; and actively collaborate with others to build student and family capacity for adaptation, self management, self advocacy, and learning. (NASN, 1999)

Supervision "is the active process of directing, guiding, and influencing the outcome of an individual's performance of an activity" (ANA, 1994, p. 10).

SUMMARY

The National Association of State School Nurse Consultants believes that schools have an obligation to ensure the quality and safe provision of school nursing services as necessary for the health, rehabilitation and well being of students with health impairments. Therefore, services should be provided by qualified nursing personnel and with utmost regard for protecting the student. School nursing services should either be directly provided by licensed professional (RN) school nurses or delegated by the RN to qualified paraprofessionals or trained unlicensed assistive personnel (UAPs). In either case, the RN retains accountability for the outcome.

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Revised: September 1998, April 2000

Appendix C.6

National Association of School Nurses

Position Statement

Delegation

HISTORY:

Advances in health care and technology offer greater opportunities for children with special health care needs to attend school. Considering the complexity of the care needed by these students, delegation of care by the school nurse to an unlicensed person in the school setting, if allowed by the state's nurse practice acts, can be a safe and fiscally responsible way to meet the health needs of the school community. Nevertheless, the school community must be aware that, to ensure the safety, health, and educational success of these students, there are limitations to the use of delegation.

DESCRIPTION OF ISSUE:

The incidence of chronic illnesses (e.g., asthma, diabetes, attention deficit disorder) in school-age children is increasing. In addition, complex medical problems that were at one time only managed at inpatient settings are now being managed in the community, including the school setting. Federal mandates and parental expectations that the school is indeed able to manage their child raises the demands for qualified personnel to ensure the health and safety of students with special health needs.

Delegation has been defined as "the transfer of responsibility for the performance of an activity to another, with the former retaining accountability for the outcome" (ANA, 1994, 11). Guidelines and standards for delegation of nursing care are further defined by each state's nurse practice act and its associated rules and regulations. Some states and territories restrict the procedures that can be delegated; others do not allow delegation at all.

Delegation of nursing care is a complex legal and clinical issue in any setting, and is especially challenging in schools. It is the school nurse who must have a clear understanding of what constitutes his or her scope of practice to ensure that state nursing practice acts are not violated, and to make certain that school health and safety are not threatened. In turn, this knowledge needs to be communicated to parents, administrators, school staff, and students to ensure they understand the legal and professional issues involved in delegation.

RATIONALE:

Only a registered nurse can delegate nursing care. It is critical that the school nurse be involved in district policy development that addresses the issue of delegation of care in the school setting.

The school nurse is responsible for using professional nursing judgment to determine the appropriate level of care needed for each student, including whether or not tasks can be delegated. Once the school nurse determines that a task can indeed be delegated (based on the definition of delegation, guidelines provided by the state's nurse practice act, and assessment of the unique characteristics of the individual student needing nursing services), an appropriate delegatee must be chosen.

By definition, a delegated nursing service requires that the nurse train and supervise the delegatee and the health outcome of the student. The training must be documented. The documentation must reflect that the delegatee understands what needs to be done and demonstrates proficiency in performing the delegated task for each student. Ongoing and regular evaluation by the registered nurse is required in accordance with state, district, and/or school policy. The school nurse must take appropriate actions when the delegatee is unsafe in performing delegated tasks.

CONCLUSION:

The National Association of School Nurses supports appropriate delegation of nursing services in the school setting, based on the definition of delegation, guidelines provided by state nurse practice acts, guidelines provided by the school nurse consultants council and the nursing assessment of the unique needs of the individual student. Only registered nurses can delegate nursing care in the school setting. The school nurse shall be involved in the development of school district policy and procedures related to delegation of care, to promote an understanding of the complex legal and clinical issues that surround delegation of care.

The health, safety, and welfare of the student must be the primary consideration in any decision to delegate. The school nurse making such a decision must be familiar with applicable nursing standards, the state's nursing practice act, and other applicable state and federal mandates. The school nurse must also be familiar with pertinent state education, public health and pharmacy laws and regulations.

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Revised: October 2002

Appendix F.1

ACCOMMODATION PLAN PERIOD from _____ to _____ Review date _____	**STUDENT** **SECTION 504** **ACCOMMODATION PLAN**
Name _____Birthdate _____ School _____ Grade _____ Date of Plan Meeting _____	
Describe the nature of the concern which results in an unequal educational opportunity due to a handicapping condition:	
Describe the basis for determination of a handicapping condition:	
Describe the reasonable accommodations that are necessary:	

Participants Name	Title
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Appendix F.2

Technical Skills and Services to Meet the Health Care Needs of Students in the School Setting

All students requiring technical skills and services to meet their health care needs at school should be seen by a registered nurse (RN) for assessment, planning and monitoring. In addition, those students should have a health care action plan written and implemented by a registered nurse. The registered nurse may be employed by the school district or contracted from an agency where nursing services are available.

When a physician's written authorization is required for specialized health care, the physician may serve as a team member to develop a health care action plan. The procedure should not be performed at school unless clearly necessary and when it cannot reasonably be accomplished outside of school hours. Students and parents should inform school personnel of techniques and procedures being used at home.

There are certain procedures that cannot be performed by a non-medical person. School personnel, including the nurse, may need additional training for some procedures. If no registered nurse is available, a physician should determine who may safely provide care.

The Department of Health and Senior Services has training videos on a number of chronic health conditions and the care required in the school setting. Commercially available procedure books also include forms on which to document the skills taught. The caregiver, the parent and the nurse should all sign off on the initial training. The person delegating the care should periodically monitor the quality of the care to ensure the procedure is being followed as taught, is being documented as required and the caregiver is reporting concerns appropriately.

The following chart describes the student's health care needs and who may be considered as a caregiver. A physician or a registered nurse should make the determination based on an assessment of the child's health status, the complexity of the procedures and the capability of the proposed caregiver. The caregiver must be provided training and support until they feel competent to provide the care. The person delegating the care must be confident the caregiver has mastered the skills necessary.

TECHNICAL SKILLS CHART

HEALTH CARE NEED	SCHOOL PERSONNEL						CIRCUMSTANCES REQUIRING NURSING JUDGEMENT	REMARKS
	RN	**LPN**	**PT**	**OT**	**T**	**O**		
Personal Care 1. Dressing (Assist with clothing)	X	X	X	X	X	X		Student and parent can inform school personnel of procedure being used at home.
2. Personal Hygiene Oral care Nail care Skin care Bathing Menstrual Hygiene	X	X	X	X	X	X	Evidence of rash, skin breakdown and/or infection	May request personal care items from parent unless activity is called for in IEP.
3. Decubitus Prevention Care	X X	X X	X	X	X	X *	*RN may determine if other caregivers may provide care for decubitus if evidence of granulation and non-healing.	Prevention care to be taught by RN, OT or PT. Requires physician's orders.
4. Positioning	X	X	X	X	X	X	Evidence of skin breakdown and/or pain on movement.	Adequate space and equipment must be available. Positioning to be taught by PT, OT, or RN.
5. Exercise (range of motion or prescribed exercise program.	X	X	X	X	X	X	Evidence of pain or restricted movement.	May require a physician order. Adaptive PE teacher should be involved.
6. Ambulation (assistance with cane, walker, wheelchair, crutches)	X	X	X	X		X		Appropriate equipment must be available. May require physician's order. Adaptive PE teacher should be involved.
7. Casts, Braces and Prostheses (observation, alignment, functioning)	X	X	X	X	X	X	Evidence of impaired circulation, infection, pain, drainage or bleeding.	

HEALTH CARE NEED	SCHOOL PERSONNEL						CIRCUMSTANCES REQUIRING NURSING JUDGEMENT	REMARKS
	RN	**LPN**	**PT**	**OT**	**T**	**O**		
8. Use of Warm and Cold Applications	X	X	X	X		X	Change in skin color, texture, or temperature beyond what is expected from application.	May require physician's order. Supplies and equipment must be available. Special precautions to be observed for students with diabetes, heart disease or unstable body temperatures.
9. Measurements Temperature, Pulse and Respiration (TPR)	X	X				*	Evidence of fluctuating or abnormal TPR.	
Blood Pressure	X	X				*	Evidence of fluctuating BP or protocol requiring BP be taken before or after medication or treatment.	Appropriate equipment must be available.
Height/Weight	X	X	X	X	X	X	Evidence of frequent fluctuations or dramatic changes. Arrested growth.	Medications may effect changes.
Intake/Output	X	X	X	X	X	X	Changes in usual patterns.	

HEALTH CARE NEED	SCHOOL PERSONNEL						CIRCUMSTANCES REQUIRING NURSING JUDGEMENT	REMARKS
	RN	**LPN**	**PT**	**OT**	**T**	**O**		
10. Medications (Assist student)	X	X				*	Medications requiring BP, radial or apical pulse before or after medication. Medications that require nursing judgement to determine dose.	The school should have a policies for medication administration, regardless of route of administration. Requires physician order (prescription) and parent authorization. Over the counter drugs require at least a parent authorization. Unlicensed personnel giving meds must be appropriately trained in specific routes of administration of medications. Training must be documented.
Oral	X	X				*	RN should provide the training of any personnel giving medications.	
Rectal	X	X				*		
Opthalmic (eye)	X	X				*		
Otic (ear)	X	X				*		
Medications via gastrostomy or nasogastric tube	X	X				*	Usually not delegated. Evidence of displacement of tube, obstruction of tube, excessive vomiting or diarrhea	Requires prescription which must specify administration via feeding tube. Nursing personnel will follow health care action plan for reinsertion of tube if displaced.
Medication via intravenous tube (already in place)	X	X					Not to be delegated except to qualified nursing personnel.	Requires prescription. If tubing obstructed, follow health care action plan.
Medications by Intramuscular or subcutaneous injection	X	X					Not to be delegated except to qualified nursing personnel. Might be given by other trained personnel in an emergency, e.g., severe allergic reaction.	Requires prescription.

HEALTH CARE NEED	SCHOOL PERSONNEL						CIRCUMSTANCES REQUIRING NURSING JUDGEMENT	REMARKS
	RN	**LPN**	**PT**	**OT**	**T**	**O**		
11. Fluids							Special diets required. Evidence of change in student's oral, motor, swallowing, positioning and/or sensory abilities.	Student and parent/guardian should inform school personnel of procedures used at home.
• Nourishment Preparation	X	X	X	X	X	X		
• Oral feedings	X	X	X	X	X	X		
• Hyperalimentation (high calorie intravenous feedings)	X						May be delegated to qualified nursing personnel.	Requires prescription
• Gastrostomy or Nasogastric tube feeding (tube or button in place)	X					*	Evidence of obstruction, malabsorption, infection at insertion site, displacement of tube, excessive vomiting or diarrhea.	Procedure requires a prescription. If feeding does not require a prescription, schools that participate in USDA school lunch program must provide formula at price of regular lunch. Nursing personnel will follow health care action plan for reinsertion of tube.

HEALTH CARE NEED	SCHOOL PERSONNEL						CIRCUMSTANCES REQUIRING NURSING JUDGEMENT	REMARKS
	RN	**LPN**	**PT**	**OT**	**T**	**O**		
12. Bowel and Bladder Care:								
• Bedpan, urinal or commode	X	X				*	Evidence of infection and/or skin breakdown.	Appropriate equipment must be available.
• Care of Incontinent student (including diapering)	X	X				*	Evidence of infection and/or skin breakdown. Bowel/bladder training may be indicated.	Parent/guardian must provide supplies and clean clothing. Is an infection control issue.
• External Urinary Catheter	X	X				*	Evidence of infection or pain.	Parent/guardian provides supplies.
• Clean Intermittent Catheterization	X	X				*	Evidence of infection, pain, bleeding, inability to insert catheter.	Requires physician order and parent authorization. Student and parent inform school of procedures used at home.
• Indwelling Catheter	X	X				*		Parent/guardian to provide supplies.
• Prescribed Bowel and Bladder Training	X	X				*	Evidence of skin breakdown or infection.	Parent/guardian to provide supplies.
• Stoma Care	X	X				*		

HEALTH CARE NEED	SCHOOL PERSONNEL						CIRCUMSTANCES REQUIRING NURSING JUDGEMENT	REMARKS
	RN	**LPN**	**PT**	**OT**	**T**	**O**		
13. Respiratory Care:								
• Postural drainage and/or percussion	X	X	X	X		*	Evidence of increasing respiratory distress	
• Spirometer (assisted deep breathing)	X					*	May be provided by respiratory therapist or delegated to qualified nursing staff. Evidence of increasing respiratory distress	Requires physician order.
• Oxygen per mask or Cannula	X					*	May be provided by respiratory therapist or delegated.	Requires physician order. Requires safety precautions for oxygen use, storage, etc. Parent/guardian provides equipment, supplies, and oxygen, and takes responsibility for moving oxygen tanks.
• Oxygen per nebulizer	X					*	May be provided by respiratory therapist or delegated. Evidence of increasing respiratory distress or obstruction. Need for medication.	Requires physician order. Alternate power supply must be available. Follow medication policy if drugs are administered via nebulizer.
• Suctioning (oral) Machine or bulb	X	X				*	Respiratory distress during suctioning. Evidence of bright red bleeding	Requires physician order.
• Tracheostomy	X	X				*		
14. Dressings:							Excessive bleeding or discharge.	
• Reinforcement	X	X				*	Complaints of pain or discomfort	
• Clean dressing	X	X				*		
• Sterile	X	X					May be delegated to qualified nursing personnel	Requires physician order. Parent/guardian provides supplies.

HEALTH CARE NEED	SCHOOL PERSONNEL						CIRCUMSTANCES REQUIRING NURSING JUDGEMENT	REMARKS
	RN	LPN	PT	OT	T	O		
15. Specimen collection (Urine, stool, sputum, Blood, throat culture)	X	X				*	Evidence of infectious disease	Requires a physician order. Is an infection control issue. Health care provider or parent/guardian provides supplies and appropriate collection container. Observe universal precautions, wearing gloves.
16. Specimen testing Urinalysis Hematocrit Blood Glucose monitoring	 X X X	 X X X				 * *	Report questionable results	Designate personnel to monitor self-testing by student. Parent/guardian to provide supplies. Requires physician order

RN – Registered Nurse
LPN – Licensed Practical Nurse
PT – Physical Therapist
OT – Occupational Therapist
T – Teacher(s)
O -- Others Includes individual appropriately trained, as specified in health care action plan for student. Training may be done by personnel listed as providers.

If another type of specialized procedure is required by a student in the school setting, the student/family, student's physician and school staff, including the registered nurse will jointly determine who can best provide the care.

Appendix F.3

Competencies of Personnel Providing Health Services in Schools

In exploring the provision of health-related services in schools, it is necessary to outline the competencies of the individual providing the care. This is necessary not only from a legal, but from an ethical standpoint. The following provides a summary of these competencies.

I. **Registered Nurse**

A. The nurse must have a current license in good standing to practice as a registered nurse in the state of Missouri.

B. Performance of professional nursing services means the performance of both independent nursing functions and delegated medical and dental functions which require specialized knowledge, judgement and skill and as governed by the Missouri Nurse Practice Act.

C. The professional nurse has an ethical and legal responsibility to provide care according to the code of ethics and the Nurse Practice Act.

D. Special competencies of the registered nurse include, but are not limited to, the ability, knowledge and skill to perform the following activities:

1. Assessment

a) Obtain health information from health care providers
b) Determine the depth to which the health assessment is required for each individual student
c) Use physical assessment skills in determining the current health status of the student
d) Interpret health history information, medical reports, nursing observations and test results
e) Determine the importance of the health information and its impact on the educational process
f) Make specific recommendations regarding care

2. Planning

a) Develop a health care plan to meet the student's individual health needs in the school setting; and
b) Collaborate with school personnel, student, parents and primary care provider to develop this plan.

3. Implementation and Evaluation

a) Coordinate all medical contacts, referrals and interpretation of medical data
b) Manage the health care plan for the student's special needs in the school setting
c) Provide direct health care services for the student when appropriate and if properly trained

d) Develop procedures and provide training for others providing care
e) Monitor the health services provided by other school personnel
f) Make recommendations to modify the school program to meet the student's health care needs
g) Provide health consultation/health education/health promotion to the student and family
h) Act as a liaison between school, community health care providers, parent and student
i) Periodically evaluate the health care plan and set new goals and objectives to meet the student's current needs

II. **Other school personnel providing health related services in school settings**

A. Professionals certified by the Missouri Department of Elementary and Secondary Education should follow the standards of their profession in relation to their involvement in the health care plan.
B. Non-certified school personnel are identified as those functioning under the direction of the principal, with consultation with the school nurse. This category would include secretaries, health aides, teacher aides, etc. This group is referred to as unlicensed assistive personnel (UAP). Licensed practical nurses must be supervised by a registered nurse or a physician.

Qualifications of these UAPs include, but are not limited to:

- Is currently trained in first aid and CPR
- Participates in training and mastery evaluation of skills
- Is dependable and reliable when working within the confines of guidelines and health care plans
- Uses discretion and respects confidentiality of information
- Exercises good judgement and requests additional assistance when necessary
- Provides designated health care services, within the individual's ability and training, for the student as identified in the plan and monitored by the registered nurse

Appendix F.4
Individualized Health Care Action Plan - Sample

Health Care Plan Period _____ to _____ Review date _____	**INDIVIDUALIZED HEALTH CARE ACTION PLAN**

I. IDENTIFYING INFORMATION	
Student's name	School
Birthdate	Teacher
Age	Grade

CONTACTS

PARENT/GUARDIAN
Mother's name _____ Home Phone_____

Address _____Work Phone _____

Father's name _____Home Phone _____

Address _____ Work Phone _____

PHYSICIAN
Physician _____Phone _____

Address _____
HOSPITAL
Hospital Emergency Room _____Phone _____

Hospital Address _____Phone _____

EMERGENCY MEDICAL SERVICES _____

II. MEDICAL OVERVIEW

Medical condition _____Any Known Allergies _____

Medications _____

Possible side effects _____

Health care procedures needed at school

III. OTHER SIGNIFICANT INFORMATION
☐ Emergency Action Plan on file ☐ Individual Health Plan on file
IV. BACKGROUND INFORMATION/NURSING ASSESSMENT
Brief Medical History
Special Health Care Needs
Social/Emotional Concerns
V. HEALTH CARE ACTION PLAN
Attach physician's order and any specialized procedure.
Student specific procedures/interventions

Procedure	Performed by	Equipment	Maintained by	Authorized/trained by

V. HEALTH CARE ACTION PLAN (cont.)		
Medications		
Dietary Needs		
Transportation Needs		
Classroom/School Modifications (including adaptive PE)		
Equipment – list necessary equipment/supplies	Provided by parent	Provided by school
None required		
Safety measures		
Substitute/Back up (when primary caregiver is not available)		
Possible problems to be expected when performing procedure(s)		
Emergency Plan _____ Transportation Plan _____		

VI. DOCUMENTATION OF PARTICIPATION

We have participated in the development of the Health Care Action Plan and agree with its contents.

Signature_____ Date _____

_____ Administrator or Designee

_____ Parent

_____ Nurse

_____ Teacher

_____

_____

VI. PARENT AUTHORIZATION FOR SPECIAL HEALTH SERVICES

We (I), the undersigned who are the parents/guardian of _____
Birthdate _____, request and approved this Health Care Action Plan. We (I), understand that a qualified person(s) will be performing the health care service. It is our understanding that in performing this service, the designated person(s) will be using the attached special care procedure which has been approved by the student's physician and health care team.

We (I) will notify the school immediately if the health status of _____
changes, if we change physicians, or there is a change or cancellation of the procedure.

We (I) agree to provide the following, if any: medication, medication equipment and supplies and dietary supplements requiring a prescription.

_____ Parent Signature Date _____	_____ Parent Signature Date _____

Appendix F.5

Emergency Action Plan - Sample

Emergency Action Plan Period _____ to _____ Review Date _____	**EMERGENCY ACTION PLAN**

I. IDENTIFYING INFORMATION

Student Name	Birthdate
Primary Physician	Phone
Specialist Physician	Phone
Preferred Hospital	Allergies

II. STUDENT SPECIFIC INFORMATION

If you see this . . .	Do this . . .

IF AN EMERGENCY OCCURS

1. Stay with the student or designate another adult to do so.
2. Call or designate someone to call the school nurse and/or principal or building administrator.
   a. State who you are.
   b. Where you are located (school, location in building).
   c. Nature of the problem.
3. The nurse will assess the child and determine whether the emergency plan should be implemented.
4. If the nurse is unavailable, the following staff members are trained to deal with this emergency, and to initiate the emergency plan. If situation appears to be life-threatening, call 911.

Staff Member(s)	Location

Appendix F.6

Transportation Plan Period from _____ To _____ Review date _____	**TRANSPORTATION PLAN FOR STUDENT WITH SPECIAL HEALTH CARE NEEDS**

I. ADAPTATIONS/ACCOMMODATIONS REQUIRED

_____ Transportation Aide

_____ Bus Lift

_____ Seat Belt

_____ Special Restraint

_____Wheel Chair tie down

_____ Space for equipment: specify _____

II. POSITIONING OR HANDLING REQUIREMENTS

_____ None

_____ Describe

III. BEHAVIOR CONSIDERATIONS

____ None

____ Describe

IV. TRANSPORTATION STAFF TRAINING
Training has been provided to drivers and substitute driver(s). ____ yes ____no Describe training provided   Date training completed _____

V. STUDENT SPECIFIC EMERGENCY PROCEDURES	
If you see this	Do this

Appendix F.7

Care of Equipment

Definitions:

Care of

implies looking after or dealing with something or someone.

Equipment

is something material with which a person, organization or entity is equipped, i.e., the instruments, apparatus or things required for a particular job or purpose.

Purpose:

- To ensure the equipment will function when needed by the student for routine care or in an emergency
- To minimize the risk of infection from equipment shared by several students
- To reduce risk of infection from repeated use of equipment by the same student

1. Obtain the manufacturer's instructions from the supplier or the parent.	• Make two copies; keep one in your building file, keep the other in a resealable bag with the piece of equipment.
2. Become very familiar with the equipment.	• Arrange for a knowledgeable representative to provide a demonstration. This might be the therapist, family member, home care provider, hospital staff, manufacturer representative, pharmaceutical sales person and/or the physician.
3. Make sure all supplies are on hand.	• Arrange for the family to provide any specialized cleaning supplies, any special tools (odd sized screwdrivers, wrenches, etc.) and spare parts (tubing, nuts, bolts, screws, spare glass suction bulbs, bottles, etc.
4. Keep parts and equipment in a labeled resealable plastic bag with the equipment.	• If it must be stored separately, attach a note to the equipment telling where it is stored.
5. Maintain a current list of local supplies of oxygen, IV equipment, odd-sized hardware.	• Keep this list as well as a notation about an individual student's supplier because you may need a second source to call in an emergency.
6. Work with the classroom teacher to establish a clean area for student's extra clothing and supplies.	• This is separate from personal care items and soiled items that will be sent home with the student.

7. Recommend that each person working with the student, wash the equipment with soap and water, rinse, disinfect, rinse and dry after each use.	• Refer to Universal Precautions regarding care of surfaces, equipment, etc.
8. Work with the building administrator and custodian to have the bathrooms and large surfaces cleaned and disinfected daily and as needed.	• Refer to Universal Precautions.
9. Determine who will prepare any disinfectant solution(s), how often and where they will be stored.	• This should be decided on a building level, usually by the custodian.
10. Work with the custodian to maintain a supply of plastic bags and disposable gloves.	• Place a supply in each classroom and work area.
11. Obtain at least one covered puncture-resistant container to be used to discard sharp items that might be contaminated with body fluids.	• Secure a sharps container for each building.
12. Provide instruction for proper care of used needles and other supplies contaminated with body fluids.	• All staff should receive instruction in Universal Precautions on an annual basis. Follow school district/local community health policy to arrange for proper disposal of the sharps container when full.
13. Assign a specific person to care for equipment used in special care procedures.	

Appendix F.8

Sample Letter To Physician Regarding Health Care Plan

DATE

Dear Dr. _____;

The _____ school district has been asked to provide specialized health care for your patient, _____.

If it is essential that this procedure be provided during school hours, we will need your written order on file.

Attached is a tentative health care plan for this student, including a description of a standardized procedure. Please review these materials, make written comments and provide the requested information to guide us in providing a safe school environment. We will incorporate your comments and make adjustments in the procedure as directed. Services will begin when we have the necessary orders and adequately trained personnel in place.

Please feel free to contact _____, who is assuming the responsibility for the management of this student's health care in our school. She (he) can be reached at _____ (add best time to call, if this is pertinent).

Sincerely,

Appendix F.9

Resources for Special Health Care Needs

The School Nurse's Source Book of Individualized Health Plans, Volume I and II, Mary Kay Haas, Editor

Missouri Association of School Nurses, Attn: Genie Drown
Ph: (573) 696-2282 or E-mail: gdrown@mail.hallsville.k12.mo.us
Volume I (book) $39.95 (plus shipping, est. $3.85)
Volume II (book) $44.95 (plus shipping, est. $3.85)

MacGill (800) 323-2841
Volume I (book) $33.60 (plus $3.75 shipping and handling)
Volume II (book) $39.90 (plus $3.75 shipping and handling)
Volume I (software only/IBM or Mac) $40.00 (plus $3.75 shipping and handling)
Volume I (book and software/IBM or Mac) $73.00 (plus $3.75 shipping and handling)

Sunrise River Press (800) 895-4585
Volume I (book) $39.95 (plus $4.95 shipping and handling)
Volume II (book) $44.95 (plus $4.95 shipping and handling)
Volume I and II (software only) $84.95 (plus $4.95 shipping and handling)
Volume I and II (software and books) $154.95 (plus $4.95 shipping and handling)

Managing the School Age Child with a Chronic Health Condition, Georgianna Larson, Editor

Missouri Association of School Nurses, Attn: Genie Drown
Ph: (573) 696-2282 or E-mail: gdrown@mail.hallsville.k12.mo.us
$29.95 (plus shipping, est. $3.85)

MacGill (800) 323-2841
$24.00 (plus $3.75 shipping and handling)

Sunrise River Press (800) 895-4585
$29.95 (plus $4.95 shipping and handling)

Children and Youth Assisted by Medical Technology in Educational Settings (1997)

(Guidelines for Care), Project School Care, Boston Children's Hospital

Paul Brookes Publishing Co (800) 638-3775
$53.00 (plus $5.30 shipping and handling)

School Health (800) 323-1305
$50.95 (plus shipping and handling)

Computerized Classroom Health Care Plans for School Nurses (3rd Edition)

(Comes with manual and more than 100 different care plans on disk and hard copy, available in Microsoft Works or Microsoft Word for IBM or Mac)

JMJ Publishers, 1156 Wilson Ave, Salt Lake City, UT 84105, Ph: (801) 487-3017
$89.00 (includes shipping and handling)

MacGill (800) 323-2841
$85.00 (plus $3.75 shipping and handling)

Pathophysiology of Diabetes

Diabetes is a chronic metabolic disorder in which the body cannot metabolize carbohydrates, fats, and proteins because of a lack of, or ineffective use of, the hormone insulin. Diabetes is classified into three primary types that are different disease entities but share the symptoms and complications of hyperglycemia (high blood glucose).

Impaired glucose tolerance, formerly known as "borderline diabetes" is a degree of hyperglycemia that may precede type 2 diabetes.

I. Type 1 (previously called insulin dependent diabetes mellitus (IDDM) or juvenile-onset diabetes)

A. Causes

1. Genetic predisposition.
2. Environmental exposure: virus, toxin, stress.
3. Autoimmune reaction: beta-cells that produce insulin in the pancreas are destroyed. When 80-90% of the beta-cells are destroyed, overt symptoms occur.

B. Characteristics

1. Usually occurs before 30 years of age, but can occur at any age. Peak incidence occurs during puberty, around 10-12 years of age in girls and 12-14 years in boys.*
2. Abrupt onset of signs and symptoms of hyperglycemia: increased thirst and hunger, frequent urination, weight loss, and fatigue.
3. Ketosis prone.

C. Treatment

1. Insulin by injection with syringes or pumps
2. Diet
3. Exercise
4. Education
5. Monitoring

II. Type 2 (previously called non-insulin-dependent diabetes mellitus, NIDDM, or adult-onset diabetes)

A. Causes

1. Insulin resistance: unable to utilize insulin that the body makes because of cell-receptor defect; glucose is unable to be absorbed into cells for fuel.
2. Decreased insulin secretion: pancreas does not secrete enough insulin in response to glucose levels.
3. Excess production of glucose from the liver: result of defective insulin secretory response; dawn phenomenon (see glossary) is an example.

B. Characteristics

1. Usually occurs after 30 years of age, but is now occurring in children and adolescents.
2. Increased prevalence in some ethnic groups, e.g., African Americans, Hispanic/Latino, Native Americans, Asian Americans, and Pacific Islanders.
3. Strong genetic predisposition.
4. Frequently obese.
5. Not prone to ketoacidosis until late in course or with prolonged hyperglycemia.
6. May or may not have symptoms of hyperglycemia.
7. May also have extreme tiredness, blurred vision, delayed healing, numbness and tingling of hands and feet, recurring yeast infection.
8. Children between the ages of 10-19 that have one or more of the following are at an increased risk:
   - Family history
   - Member of certain ethnic populations listed above in B.2.
   - Overweight
   - Sedentary lifestyle

* Source: American Diabetes Association. Diabetes Facts. November, 2003.

Pathophysiology of Diabetes

- Pre-puberty.
- Signs of insulin resistance or conditions associated with insulin resistance (acanthosis nigricans [dirty-neck syndrome], hypertension [high blood pressure], dyslipidemia [lipoproteins inbalance], polycystic ovarian syndrome [PCOS]).

C. Treatment

1. Diet/weight management
2. Exercise/increase physical activity
3. Oral hypoglycemic/antihyperglycemic agents, insulin sensitizers, or insulin
4. Education
5. Monitoring
6. Treatment of comorbid conditions (e.g., hypertension, lipid abnormalities)

III. Gestational Diabetes Mellitus (GDM)

A. Causes

1. Insulin resistance due to pregnancy
2. Genetic predisposition

B. Characteristics

1. Carbohydrate intolerance during pregnancy identified via 1-hour screen using a 50-g oral glucose load (performed between 24th and 28th week of gestation unless otherwise indicated). If the 1-hour screen for glucose is ≥140 mg/dl (≥7.8 mmol/l), a full diagnostic 100-g, 3-hour oral glucose tolerance test (OGTT) is indicated.

C. Treatment

1. Diet: provide adequate calories without hyperglycemia or ketonemia
2. Exercise: program that does not cause fetal distress, contractions, or hypertension (>140/90 mmHg).
3. Insulin: if unable to consistently maintain blood glucose ≤95 mg/dl fasting (≤5.3 mmol/l) and ≤140 mg/dl (≤7.8 mmol/l) 1 hour postprandial and ≤120 mg/dl (≤6.7 mmol/l) 2 hours postprandial.

D. Monitoring

1. Blood glucose: required to determine effectiveness of treatment and possible need for insulin. Glucose should be checked fasting and 1-2 hours postprandial.
2. Ketones: test for ketones using first morning urine sample. Presence of ketones may indicate starvation rather than hyperglycemic ketosis.

For more information about the pathophysiology of diabetes, see the American Diabetes Association's 2004 position statement "Diagnosis and Classification of Diabetes Mellitus" *Diabetes Care*, Volume 27, Supplement 1, pages S5-S10.

For more information about the dyslipidemia often associated with diabetes, please see the American Diabetes Association's 2003 consensus statement, "The Management of Dyslipidemia in Children and Adolescents with Diabetes", *Diabetes Care*, Volume 26, number 7, pages 2194-2197.

Both of the above-mentioned articles can be accessed at: http://care.diabetesjournals.org/.

Adapted from: Ballard, A.M., 2000. *Pathophysiology of diabetes.* "The Diabetes Ready-Reference Guide for Health Care Professionals" by the American Diabetes Association.©

Rights of Children with Diabetes in Public Schools

Getting ready for a new school year is demanding. However, if a child has diabetes, the return to school can be even more difficult. Educating school personnel while preparing your child for a new environment can be awesome and overwhelming even when the school administration is supportive. Many parents face school personnel who will not cooperate when trying to arrange for a child's diabetes management during school time. What many parents do not know is that such resistance can, in fact, be illegal.

One of the first legislative steps toward systematically eliminating discrimination against people with disabilities came with the Rehabilitation Act of 1973. Under this law, individuals with disabilities were protected against discrimination in any federally funded program, including the public school system.

Two years later, the Education for All Handicapped children Act of 1975, amended in 1991 and renamed the Individuals with Disabilities Education Act (I.D.E.A.), guarantees a "free, appropriate, public education," including special education and related service programming, to all youth with disabilities who require it.

Many people are not aware that these anti-discriminatory disability laws explicitly cover children with diabetes. All schools receiving federal funds must make reasonable accommodation for the special needs of children with diabetes in order to assure them a "free, appropriate, public education."

In other words, if your child requires snacks in the classroom, freedom to go to the restroom, allowances to participate fully in extracurricular activities without restriction, or any other diabetes-related service, the school is mandated to reasonably accommodate. In fact, I.D.E.A. requires the school to actively seek out children with disabilities, including diabetes, and to work with the parents developing a program that would best suit the child's specific medical needs.

The Department of Education is monitoring the implementation of these various anti-discriminatory education laws. They have scheduled hearings to speak with area advocates about how children with disabilities are being accommodated.

Additional information can be found in the American Diabetes Association's, *Diabetes Care*, Volume 27, Supplement 1, Pages S122-S128, Clinical Practice Recommendations 2004 or visit their website at www.diabetes.org.

Source: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses.

Why is Type 2 Diabetes in Children on the Rise?

In 1998, former U.S. Surgeon General David Satcher declared the soaring rate of childhood obesity an epidemic. Data collected by the federal Centers for Disease Control and Prevention (CDC) indicate the prevalence of adult obesity (defined as a body mass index of 25 or more) has soared in the last 30 years.[1] Body mass index (BMI) is a mathematical formula in which a person's body weight in kilograms is divided by the square of his or her height in meters, i.e., wt/ht. Nearly one in five Americans was considered obese in 1998. By 2001, the prevalence of obesity had increased to 20.9%, which was a 5.6% increase from 2000[2]. Although the reasons for the obesity epidemic have not been confirmed, the prevalence of obesity has increased so rapidly, we know its origin is not genetic.[3]

Former U.S. Surgeon General Dr. C. Everett Koop has said that "except for smoking, obesity is now the number one preventable cause of death in this country."[4] Obesity may also be the number one preventable risk factor associated with type 2 diabetes in children and adolescents. According to the American Medical Association, losing weight is the single most effective way to reduce the risk of developing diabetes and to manage it.[5]

A healthy diet and exercise are critical to losing weight. Therefore, it is not surprising that research suggests type 2 diabetes may be preventable through proper nutrition and exercise. These, along with blood glucose monitoring and medication treatment methods, should be fully supported by family and health care professionals.[6]

Although type 2 diabetes is a problem among youth, nationally representative data to monitor diabetes trends among youth are not yet available. In response to the growing public health concerns about both type 1 and type 2 diabetes, the CDC and the National Institutes of Health (NIH) are funding a 5-year study, called the SEARCH study, to examine the current status of diabetes among children and adolescents in the United States.[6] If the SEARCH study accomplishes its goals, it will provide valuable information to researchers and health care professionals about both types of diabetes.

The specific goals of the SEARCH study are:

- To develop a uniform classification of types of diabetes
- To estimate the number of new and existing childhood diabetes cases by type, age of the child, sex, and racial or ethnic group
- To describe the clinical characteristics of different types of diabetes in youth and how they evolve
- To describe the complications of diabetes in children and adolescents
- To describe the quality of life of children and adolescents with type 2 diabetes[7]

Sources:

[1] Centers for Disease Control and Prevention. Defining overweight and obesity. http://www.cdc.gov/nccdphp/dnpa/obesity/

[2] Mokdad AH, Ford ES, Bowman BA, Dietz WH, Vinicor F, Bales VS, Marks JS. Prevalance of obesity, diabetes, and obesity-related health risk factors, 2001. JAMA. 2003; 289(1):76-9.

[3] National Center for Chronic Disease Prevention and Health Promotion. *Chronic Disease Notes & Reports, Preventing Obesity Among Children*. Vol 13 No 1, Winter 2000.

[4] Koop CE, as quoted by CNN. The Global Spread of Obesity, January 12, 2000.

[5] American Diabetes Association. Diabetes Type 2: Reducing your risk, 1998, as adapted from Type II Diabetes: Reducing Your Risk, 1996.

[6] Brosnan CA, Upchurch S, Schreiner B. 2001. Type 2 diabetes in children and adolescents: An emerging disease. *Journal of Pediatric Health Care* 15(4):187-193.

[7] Centers for Disease Control and Prevention. Fact Sheet: SEARCH for Diabetes in Youth. December 19, 2002. http://www.cdc.gov/diabetes/pubs/factsheets/search.htm

Type 2 Diabetes in Children and Adolescents

In 1999, the American Diabetes Association convened a consensus development conference on type 2 diabetes in children and adolescents. This development conference was held to assess present understanding and knowledge, as well as provide guidance to health care providers on the medical management of type 2 diabetes in children and adolescents.

The eight-member panel developed a consensus statement on the six following questions:

1. What is the classification of diabetes in children and adolescents?
2. What is the epidemiology of type 2 diabetes in children and adolescents?
3. What is the pathophysiology of type 2 diabetes in children and adolescents?
4. Who should be tested for diabetes?
5. How should children and adolescents with type 2 diabetes be treated?
6. Can type 2 diabetes in children and adolescents be prevented?

A brief summary of this consensus statement is provided below. For the complete consensus statement, go to the American Diabetes Association's website: http://care.diabetesjournals.org/cgi/reprint/23/3/381.pdf

Currently, children with type 2 diabetes are usually diagnosed over the age of 10 years and are in middle to late stage of puberty. As the childhood population becomes increasingly overweight, type 2 diabetes may be expected to occur among younger prepubertal children.

Only those children who are at substantial risk should be tested for type 2 diabetes. The panel recommended if **the child was overweight and had two or more** of the risk factors listed below, testing should be done every 2 years starting at the age of 10 years or at onset of puberty.

- Family history of type 2 diabetes
- Non-European ethnicity/ancestry
- Signs of insulin resistance or conditions associated with insulin resistance (acanthosis nigricans [also referred to as "dirty-neck" syndrome], hypertension, dislipidemia, etc.)
- Patient age (starting at the age of 10 years or at onset of puberty)

Consider testing in any other high risk patients who display any of the characteristics listed above, **including overweight**.

Primary prevention of type 2 diabetes in children should ideally include a public health approach that targets the general population. Health professionals need to be involved in developing and implementing school- and community-based programs to promote improved dietary and physical activity behaviors for all children and their families. At the com-

munity level, schools, religious organizations, youth and family organizations, and government agencies should assume some responsibility for promoting a healthy lifestyle. Planning of effective preventative efforts for populations at-risk needs to involve members of those at-risk groups.

Source: *Diabetes Care*, 2000 Consensus Statement, Volume 23, Number 3, Pages 381-389, "Type 2 Diabetes in Children and Adolescents", American Diabetes Association.

Acanthosis Nigricans

"Acanthosis Nigricans" (AN) is a skin condition that signals high insulin levels in the body. This skin condition is referred to as a "velvety" hyperpigmented (darkened) skin change, often found on the neck, axilla, groin, and other flexural areas. It is also associated with polycystic ovarian syndrome (PCOS) in which many girls may have AN, along with obesity, irregular menses, acne and hirsutism.

Why is Acanthosis Nigricans Important?

Acanthosis Nigricans can help identify persons who have high insulin levels and who may be at-risk for developing diabetes. Once identified, the necessary measures to lower the insulin levels and reduce the risk of developing diabetes can be taken. Exercise and proper nutrition will help the body become more sensitive to insulin and lower insulin levels.

Scientists have also found that having high insulin levels over long periods of time can increase the risk of the following conditions:

- Cardiovascular disease problems
- Hypertension (High Blood Pressure)
- Increased cholesterol and triglycerides

The Centers for Disease Control (CDC) recognize that, although acanthosis nigricans is a marker for high levels of insulin, it should not be used to predict diabetes and they strongly discourage acanthosis nigricans screening of children in school or community settings.

For more information on CDC's statement, visit their website at http://www.cdc.gov/diabetes/news/docs/an.htm.

Source: "Acanthosis Nigricans – A Sign of the Times", Texas Tech University Health Sciences Center, Edinburg, Texas, 2001.

Nutrition Guidelines for Diabetes

I. Goals of Nutrition Management

- Maintain as near-normal blood glucose as possible by balancing food intake with insulin or oral blood glucose-lowering medications and physical activity.

- Provide adequate calories for normal growth and development rates in children and adolescents.

- Prevent and treat complications of diabetes including hypoglycemia and abnormal serum lipid levels.

- Improve overall health through good nutrition.

II. Individualized Meal Planning

All people with diabetes should meet with a registered dietitian or nutrition counselor specialized in diabetes to individualize their meal plan based on their nutritional needs and usual eating habits.

A. The calorie level of the meal plan is based on individual needs for growth and development as well as their physical activity level.

   Children and adolescents, even if overweight, should not have calories restricted that could limit their normal growth and development.

B. Spacing of food intake, particularly carbohydrate foods, throughout the day is key to blood sugar control. The *amount* and *timing* of carbohydrate foods should be balanced with physical activity and insulin or oral medication.

C. The type of carbohydrate is no longer restricted in the diabetic diet. For years, sugar (sucrose) was omitted and starches were preferred to natural sugars (lactose and fructose) found in milk and fruit. Scientific evidence has shown that all carbohydrates are digested and absorbed at similar rates. All carbohydrates are now counted as equal in terms of blood sugar regulation.

Carbohydrate foods are now interchanged using the amount of 15 grams for one serving of carbohydrate in a meal plan. Preference is given to whole grains, fruits, vegetables, and "low fat" milk because of their nutritional value, not because of the type of carbohydrate they contain.

III. Nutrition Recommendations

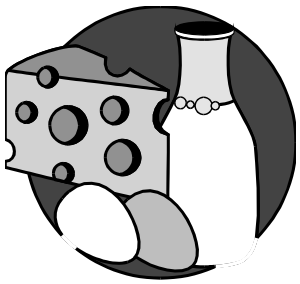
The Dietary Guidelines for Americans provides nutrition recommendations for health and disease prevention. Nutrition recommendations for children and adolescents include:

- Aim for a healthy weight by choosing sensible portions and being physically active every day.

- Eat at least 5 servings of vegetables and fruits every day.

- Choose a variety of grain foods, especially whole grains.

- Choose plenty of calcium rich foods including milk and milk products each day.



- Choose a diet that is moderate in total fat and limited in saturated fat and cholesterol.

- Limit beverages high in sugar.

- Moderate the use of salt.

- Avoid alcoholic beverages. Alcohol may cause hypoglycemia; risk is increased if taking insulin or sulfonylureas.

IV. Meal Planning Approaches

A meal pattern provides the *framework* for making food choices. Key to all meal plans is controlling the amount and the spacing of carbohydrate foods eaten throughout the day. Carbohydrate foods include milk, starches, fruits, and other high carbohydrate foods (i.e. sweets).

- **Exchange Lists for Meal Planning** is a frequently used approach. Meal plans specify the number of servings from each food group that should be eaten at each meal and snack. Food groups list measured amounts of foods that may be exchanged for one another and provide similar calorie, carbohydrate, protein, and fat content.

  Nutrition guides and exchange information for fast food restaurants and national chains are available at: http://www.diabetes.about.com/cs/nutriondiet/a/fast_food_guide.htm/

- **Carbohydrate counting** This approach counts only grams of carbohydrate in foods. It is used when greater simplicity and flexibility are desired. Insulin amounts may be adjusted before each meal based on the grams of carbohydrate at that particular meal.

  The Joslin Diabetes Center at Harvard University has created web-based materials on carbohydrate counting. *"Carbohydrate Counting: As easy as 1-2-3"* can be accessed at: http://www.joslin.harvard.edu/education/library/wcarbsug.shtml/

- **Diabetes Food Pyramid** differs from the USDA's Food Guide Pyramid by grouping starchy vegetables and dried beans with the grain foods because of their similar carbohydrate content. See page 63 for a copy of the Diabetes Food Pyramid.

Eating Healthy

With the Diabetes Food Pyramid

The Diabetes Food Pyramid has six food group sections. The largest group - grains, beans and starchy vegetables - is on the bottom and serves as the base of the pyramid. This means that you should eat more servings from this group than of any of the other food groups. The smallest group - fats and sweets - is at the top of the pyramid, emphasizing that you should eat less of these foods.

The number of servings you need from each food group depends on your nutrition needs, your lifestyle, and the foods you like to eat. For a healthy meal plan that is based on your individual needs, you should work with a registered dietitian (RD). The following chart shows a sample number of servings from the pyramid food groups for different calorie needs. Carbohydrate food groups (marked as *) may be interchanged.

Daily Calories	**1500**	**1800**	**2000**	**2200**	**2500**
*Grains, Beans and Starchy Vegetables	7	9	10	11	12
Vegetables	3-5	3-5	3-5	3-5	3-5
*Fruits	3	3	3	4	4
*Milk, skim	2	3	3	3	4
Meat	2	2	2-3	2-3	2-3
Fats	4	5	6	6	8
*Sweets	Substitute by counting each 15 grams of carbohydrate for one serving of a carbohydrate food group.				

Keep your blood sugar at a healthy level each day.

- Divide your food intake evenly throughout the day into regular meals and snacks.
- Distribute carbohydrate foods so that about the same amount of carbohydrates are eaten at about the same times each day.
- Do not skip meals or snacks.

Eating Healthy
With the Diabetes Food Pyramid

Sample 1800 Calorie Meal Pattern

Meal Pattern:

Breakfast
- 2 starch
- 1 fruit
- 1 milk
- 1 fat

Morning Snack
- 1 starch and 1 fruit

Lunch
- 1 meat
- 1 starch
- 1 vegetable
- 1 fruit
- 2 fat
- 1 milk

Afternoon Snack
- 1 starch

Supper
- 2 starch
- 3 vegetables
- 1 meat
- 4 fat

Evening Snack
- 1 fruit, 1 milk

Sample Menu:

Breakfast
- 1/2 cup oatmeal
- 1 slice toast
- 1/2 cup orange juice
- 1 cup skim milk
- 1 teaspoon margarine

Morning Snack
- 3 graham cracker squares
- 1 small apple

Lunch
- 2 slices whole wheat bread
- 2 teaspoons mayonnaise
- 1 cup carrot and celery sticks
- 1 orange
- 2-3 oz sliced ham
- 1 cup skim milk

Afternoon Snack
- 4-6 crackers

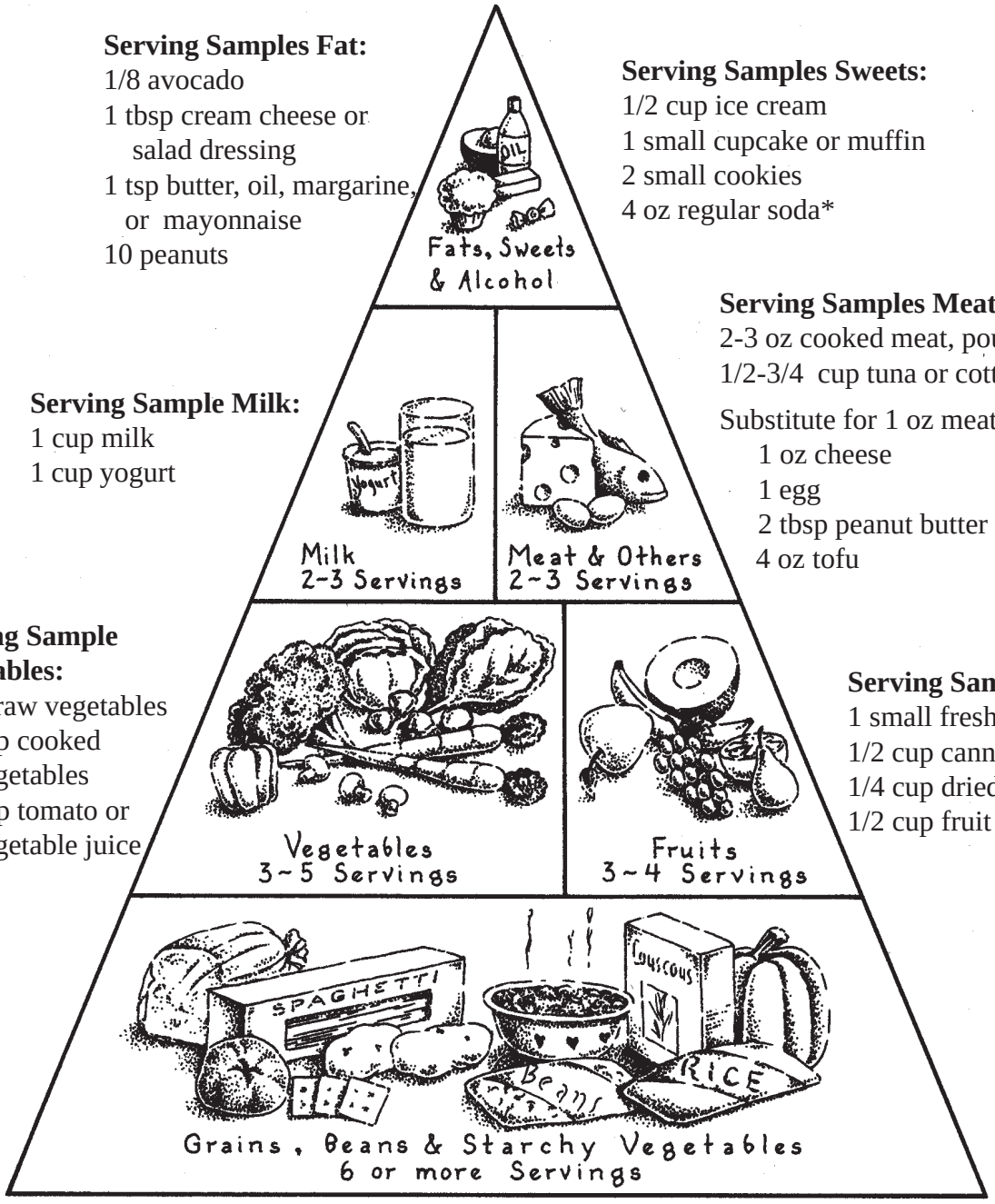
Supper
- 2-3 oz chicken
- 1/2 cup potatoes
- 1/2 cup corn
- 1/2 cup green beans
- 1/2 cup tomato juice
- 2 teaspoons margarine

Evening Snack
- 1/2 cup peaches (light syrup)
- 1 cup skim milk

The Diabetes Food Pyramid

Serving Samples Fat:
1/8 avocado
1 tbsp cream cheese or salad dressing
1 tsp butter, oil, margarine, or mayonnaise
10 peanuts

Serving Samples Sweets:
1/2 cup ice cream
1 small cupcake or muffin
2 small cookies
4 oz regular soda*



Serving Sample Milk:
1 cup milk
1 cup yogurt

Serving Samples Meat & Others:
2-3 oz cooked meat, poultry, or fish
1/2-3/4 cup tuna or cottage cheese

Substitute for 1 oz meat:
1 oz cheese
1 egg
2 tbsp peanut butter
4 oz tofu

Serving Sample Vegetables:
1 cup raw vegetables
1/2 cup cooked vegetables
1/2 cup tomato or vegetable juice

Serving Samples Fruits:
1 small fresh fruit
1/2 cup canned fruit
1/4 cup dried fruit
1/2 cup fruit juice

Serving Samples Grains, Beans, and Starchy Vegetables:

English muffin or pita bread	1 slice bread	1/2 small bagel
1/2 hamburger or hot dog bun	1 6-inch tortilla	4-6 crackers
1/2 cup cooked cereal, pasta, or bulgur	3/4 cup dry cereal	1 small potato
1/2 cup cooked sweet potato	1/2 cup cooked rice	1 cup wintersquash
1/2 cup cooked beans, lentils, peas, or corn		

* The American Academy of Pediatrics discourages the use of soda in the school setting. (Soft Drinks in School. *Pediatrics*.113(1): 153 154.2004).

Classroom Snacks

Room parties and birthday celebrations frequently bring snacks into the classroom. Sugar sweetened foods, once considered “taboo” for children with diabetes, may be included with careful planning.

Carbohydrate food groups include Grains, Beans and Starchy Vegetables, Milk, Fruit, and Sweets. The type of carbohydrate you eat is not as important as once believed. It is the amount and the spacing of carbohydrates throughout the day that is key to diet control of blood sugar. Sweets may be included if substituted for other foods that contain similar amounts of carbohydrates. To help with substitutions, the amount of a food that contains approximately 15 grams of carbohydrate is considered one carbohydrate food group serving.

Help children learn to celebrate with games, contests, and adventures, instead of focusing on food as many adults do. Celebrate by offering non-food treats, such as stickers, pencils, pens, crayons, and party favors.

When sweets are served, choose ones with healthy ingredients when possible. Sweets that include whole grains and fruits, such as oatmeal raisin cookies or carrot muffins, add fiber and important nutrients.

To encourage healthy eating habits for all children, serve low sugar snacks, such as graham crackers, fruit chunks, and vegetable sticks.

Examples of Snack Substitutions are provided on pages 65-66.

Snack Substitutions

PLEASE CHECK ALL NUTRITION LABELS TO VERIFY THE AMOUNT OF CARBOHYDRATES IN EACH SERVING. If unsure, contact your food service manager.

Snack/Sweet	Serving Size	Carbohydrate Servings*
Brownie: no icing	2 " square	1
frosted	2 " square	2
Cake: no icing	2 " square	1
frosted	2 " square	2
Candy bar: snack size	1 bar (1 oz)	1
miniatures	3	1
Candy, hard	3 round pieces	1
Chips, potato or tortilla	10-15 chips (1 oz)	1
Chocolate kisses	5	1
Cookie	3 inch	1
Crackers, snack	4-5	1
Cupcake: no icing	1 small	1
frosted	1 small	2
Doughnut: plain cake	1 med (1½ oz)	1½
glazed	3 inch (2 oz)	2
Fruit: canned	½ cup	1
fresh	1 small	1
Fruit juice 100%	4 oz	1
Fruit juice bars, 100% juice	1 (3 oz)	1

*15 grams of carbohydrate = 1 carbohydrate serving

Snack Substitutions

PLEASE CHECK ALL NUTRITION LABELS TO VERIFY THE AMOUNT OF CARBOHYDRATES IN EACH SERVING. If unsure, contact your food service manager.

Snack/Sweet	Serving Size	Carbohydrate Servings*
Fruit snacks, chewy	1 roll (3/4 oz)	1
Gelatin, regular	½ cup	1
Gingersnaps	3	1
Granola bar	1 (1 oz)	1
Graham crackers	3 squares	1
Ice cream	½ cup	1
Frozen yogurt	½ cup	1
Muffin	1 small	1
Popcorn, popped	3 cups	1
Pretzels, mini twists	15 (3/4 oz)	1
Pudding: no added sugar	½ cup	1
regular	½ cup	2
Soda: regular	4 oz	1
diet	4 oz	0
Vanilla wafers	5	1
Vegetables – non starchy	3 cups raw	1
Vegetable juice	4 oz	1
Yogurt, sweetened fruit	1 cup	3

*15 grams of carbohydrate = 1 carbohydrate serving

Eating Disorders and Diabetes

An eating disorder is a serious emotional and physical illness that can have life-threatening consequences, especially for children and adolescents with diabetes. Eating disorders—such as anorexia, bulimia, and binge eating disorders—are very complex conditions that require professional help.

Although each type of eating disorder has unique characteristics, all involve the control and manipulation of food and body weight in an attempt to cope with underlying feelings and emotions.

ANOREXIA NERVOSA is characterized by self-starvation and excessive weight loss.

Symptoms include:

- Refusal to maintain body weight at or above a minimally normal weight for height, body type, age, and activity level
- Intense fear of weight gain or being "fat"
- Feeling "fat" or overweight despite dramatic weight loss
- Loss of menstrual periods
- Extreme concern with body weight and shape

BULIMIA is characterized by a secretive cycle of binge eating followed by purging. Bulimia includes eating large amounts of food—more than most people would eat in one meal—in short periods of time, then getting rid of the food and calories through vomiting, laxative abuse, or over-exercising.

Symptoms include:

- Repeated episodes of binging and purging
- Feeling out of control during a binge and eating beyond the point of comfortable fullness
- Purging after a binge, (typically by self-induced vomiting, abuse of laxatives, diet pills and/or diuretics, excessive exercise, or fasting)
- Frequent dieting
- Extreme concern with body weight and shape

BINGE EATING DISORDER (also known as COMPULSIVE OVER-EATING) is characterized primarily by periods of uncontrolled, impulsive, or continuous eating beyond the point of feeling comfortably full. While there is no purging, there may be sporadic fasts or repetitive diets and often feelings of shame or self-hatred after a binge. People who overeat compulsively may struggle with anxiety, depression, and loneliness, which can contribute to their unhealthy episodes of binge eating. Body weight may vary from normal to mild, moderate, or severe obesity.

Complications

Severe medical conditions that can occur with eating disorders include electrolyte imbalance, irregular heartbeat, low blood pressure, thinning of the walls of the heart, osteoporosis (brittle bones), hair loss, tooth erosion, gum problems, and swelling of the salivary glands.

Compulsive eating without purging leads to obesity, a risk of high blood pressure, high blood cholesterol, gallstones, heart attack, stroke, respiratory problems, and often, diabetes.

Eating Disorders and Diabetes
The management of diabetes may create a preoccupation, even an obsession, with food. Diabetes can lead someone to see food as dangerous, something to avoid. Worrying about eating the wrong foods, or classifying certain foods as either good or bad are unhealthy mindsets that can influence the development of an eating disorder.

Having diabetes may also trigger psychological factors that influence the development of eating disorders, including low self-esteem, feelings of inadequacy or lack of control in life, depression, anxiety, anger, or loneliness. The child or adolescent with diabetes may use excessive control of their food and weight as a means of dealing with these emotions and feelings. For teenagers with diabetes, feelings that their families are overly involved in their lives may trigger rebellion and a fight to become independent at almost any cost.

Teens learn quickly that poor glucose control leads to weight loss and that improved glucose control can lead to weight gain. The long-term consequences of high glucose levels are seen as being less important than the immediate rewards of weight loss or maintenance.

A major concern regarding eating disorders and diabetes is that the eating disorders may go undetected until serious complications have developed. Weight loss resulting from an eating disorder may be passed off as the result of careful diabetes control. Skipping or cutting back on insulin can mask binge eating.

Diabetes Dangers
Because people with diabetes and an eating disorder have unhealthy blood glucose levels over a long period of time, they are at great risk for diabetes complications that can affect every system of the body.

Hypoglycemia (low blood sugar) is a risk when food is restricted, meals are skipped, or food is purged.

Hyperglycemia (high blood sugar), severe enough to bring on ketoacidosis, which can lead to death, may occur if insulin is skipped or the dose of insulin reduced.

Prevention
The following recommendations can help minimize the influence of diabetes management in development of eating disorders.

- Focus on food choices rather than food restrictions. All foods, including sweets may be worked into a diet for diabetes with planning. (See Classroom Snacks, under Nutrition Section for substitutions).

- Don't expect perfection in diet compliance.

- Avoid emotional or judgmental labels for foods or eating behaviors. Do not categorize foods as "good or bad", or say that a person is "good or bad" based on how or what they eat.

• Make sure that a child's or adolescent's meals and snacks include foods that he/she enjoys and allows for their favorite foods to be included. • Avoid making the person with diabetes feel different. Singling them out may result in feelings of isolation and loneliness.	Recommend consultation with a Certified Diabetes Educator or a Registered Dietitian if you feel that the meal plan needs adjusting to meet the individual's needs or food preferences. For more information, contact *Eating Disorders Awareness and Prevention, Inc.* at 603 Stewart St., Suite 803, Seattle, WA 98101

504 Dietary Plan

Section 504 of the Rehabilitation Act of 1973 assures handicapped students access to school meal service, even if special meals are needed because of their handicap.

"Handicapped student" means any student who has a physical or mental impairment, which substantially limits one or more life activities, has a record of such an impairment, or is regarded as having such an impairment.

If special meals are needed and requested, certification from a medical doctor or health care provider must 1) verify that special meals are needed because of the handicap, and 2) prescribe the alternate foods and forms needed.

Completion of the following by a student's physician or health care provider will provide the necessary certification:

NAME OF STUDENT FOR WHOM SPECIAL MEALS ARE REQUESTED:

_____

Food Prescribed	Form Allowed (e.g. fresh, baked, ground, blended, etc.)
Meat & meat alternates	
Milk & milk products	
Bread & cereal	
Fruits & vegetables	

Other Dietary Information and Directions

I certify the above named student is in need of special school meals prepared from the above-indicated foods and forms because of a handicap.

_____ _____

Physician or Health Care Provider's Signature Date

Source: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses.

- Meal Plan Sample on Back –

Meal Plan Sample

Be sure to communicate with your food service manager to confirm the nutrition content of meals.

Meal Plan (Calories) _____ Date _____

Time	Number of Exchanges/Choices	Total Carbohydrate Grams
	___ Carbohydrate group _____ Starch* _____ Fruit _____ Vegetable _____ Milk _____ ___ Meat group _____ ___ Fat group _____	
	___ _____ ___ _____	
	___ Carbohydrate group _____ Starch* _____ Fruit _____ Vegetable _____ Milk _____ ___ Meat group _____ ___ Fat group _____	
	___ _____ ___ _____	
	___ Carbohydrate group _____ Starch* _____ Fruit _____ Vegetable _____ Milk _____ ___ Meat group _____ ___ Fat group _____	
	___ _____ ___ _____	

* Starches include grains (rice, bread, pasta, etc.), beans, starchy vegetables, and foods listed as "other carbohydrates" on the diabetes exchange lists.

The Joslin Diabetes Center at Harvard University has created web-based materials on carbohydrate counting. *"Carbohydrate Counting: As easy as 1-2-3"* can be accessed at:
http://www.joslin.harvard.edu/education/library/wcarbsug.shtml/

Exercise and Diabetes

Children with diabetes should be encouraged to participate in regular physical activity. This includes participation in physical education classes, team sports, and other activities.

Benefits of exercise for the child or adolescent with diabetes include:

- Lowers blood glucose levels
- Improves cardiovascular conditioning
- Helps with weight loss or weight maintenance
- Increases flexibility, muscle strength, and endurance
- Improves self-image, overall attitude, and quality of life

Special Considerations for Children with Diabetes:

- Exercise may cause hypoglycemia (during exercise as well as up to 24 hours after exercise of long duration) so food and/or insulin may need to be adjusted.

- The child should test blood glucose before exercise and may need to test during exercise if the exercise is of long duration or high intensity, or the child exhibits symptoms of low blood glucose.

- The child should not exercise if blood glucose is <70 or >240 mg/dl and they have urine ketones.

- The child may exercise if low blood sugar is treated successfully.

- The child may exercise if their blood glucose is >240 mg/dl and they DO NOT have urine ketones.

- The child should carry or have easy access to a food or fluid containing simple sugar (e.g. glucose tabs).

- The child should always wear diabetes identification in a visible location.

Additional Food for Activity

The blood sugar should be checked according to the student's Individualized Health Plan and proper measures should be taken to keep the level in the appropriate range. The following chart illustrates actions that **might** be recommended by the students' health care provider to maintain a safe blood sugar during physical activity

Type of Activity	If Blood Sugar prior to activity is:	Then eat the following before activity:
Light Intensity or Short Duration (Examples: walking, leisurely biking - activity lasting less than 30 minutes)	<100 >100	15 gm of carbohydrate No extra food needed
Moderate Intensity and Duration (Examples: tennis, jogging, golfing, - activity lasting 30 minutes to an hour)	<100 100-180 180-240*	25-50 gm of carbohydrate before exercise 15 gm of carbohydrate No extra food needed
Strenuous Activity (Examples: hockey, basketball, swimming, soccer, roller blading – activity lasting 60 minutes or more)	<100 100-180 180-240*	50 gm of carbohydrate 25-50 gm of carbohydrate 15 gm of carbohydrate

***If blood sugar is >240, check for the presence of ketones in the urine. For more details on ketones, see page 92.**

Snack Suggestions		
15 grams Carbohydrate: 1-4 oz juice box 1 cup Gatorade 1 apple or orange 1 small box raisins 6 saltine crackers 1 cup light yogurt ¾ cup dry unsweetened cereal 1 slice bread	**30 grams Carbohydrate:** 1 cereal bar 1-8 oz juice box 2 slices bread 1 small bagel	**45-50 grams carbohydrate:** 1 cup Gatorade plus 1 cereal bar 1 medium banana plus one small bagel

Adapted from: Department of Health and Senior Services , *Missouri Diet Manual*, 9th Edition, 2003. "Diabetes in Children A Resource Guide for School Personnel", 2002, Illinois Department of Human Services. http://www.iasn.org/diabetes.pdf

Exercise Safety Tips

Because exercise affects the way glucose (sugar) is used in your body, people with diabetes who take insulin need to take some precautions when they exercise. These safety measures will help to prevent low blood sugar reactions.

Guidelines to follow during exercise:

1. PE classes should ideally be scheduled after a meal (Breakfast or Lunch) to prevent low blood sugar.

2. **DO NOT** exercise when blood sugar levels are low, unless treated successfully.

3. **DO NOT** exercise if your blood sugar is >240 mg/dl and you have ketones. If you have a blood sugar >240 mg/dl but **DO NOT** have ketones, exercise with caution.

4. Watch for signs of low blood sugar during exercise. If you feel them, **STOP** the activity, **EAT** some fast-acting sugar, and **TELL** an adult.

5. To decrease the chances of having a low blood sugar, it is best to exercise ½ to 1 hour after a meal or snack.

6. It is important to drink lots of fluids, especially water, during long periods of exercise.

7. Avoid giving insulin into muscles you will be using during exercise to prevent the insulin from working too fast. This will help reduce the chance of a low blood sugar reaction.

8. It is also important to eat enough carbohydrates during the hours after exercise to prevent low blood sugar reactions later on.
   NOTE: The effect of exercise may last up to 24 hours after exercise and varies from person to person.

9. Carry some simple sugar with you in case of a low blood sugar.

10. Always wear diabetes identification in a visible location.

11. It is best to exercise with at least one other person.

12. Be sure to tell friends, coaches, teachers, and/or other people of the possibility of low blood sugar during exercise.

13. Be sure to instruct others about recognizing and treating low blood sugar.

14. Wear the right shoes and clothing for the weather and type of exercise you are doing.

15. Take care of any injuries immediately, especially foot injuries.

Adapted from: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses.

Family Nutrition Education Programs
Nutrition and Lifeskills for Missouri Families

Activity Pyramid for Kids

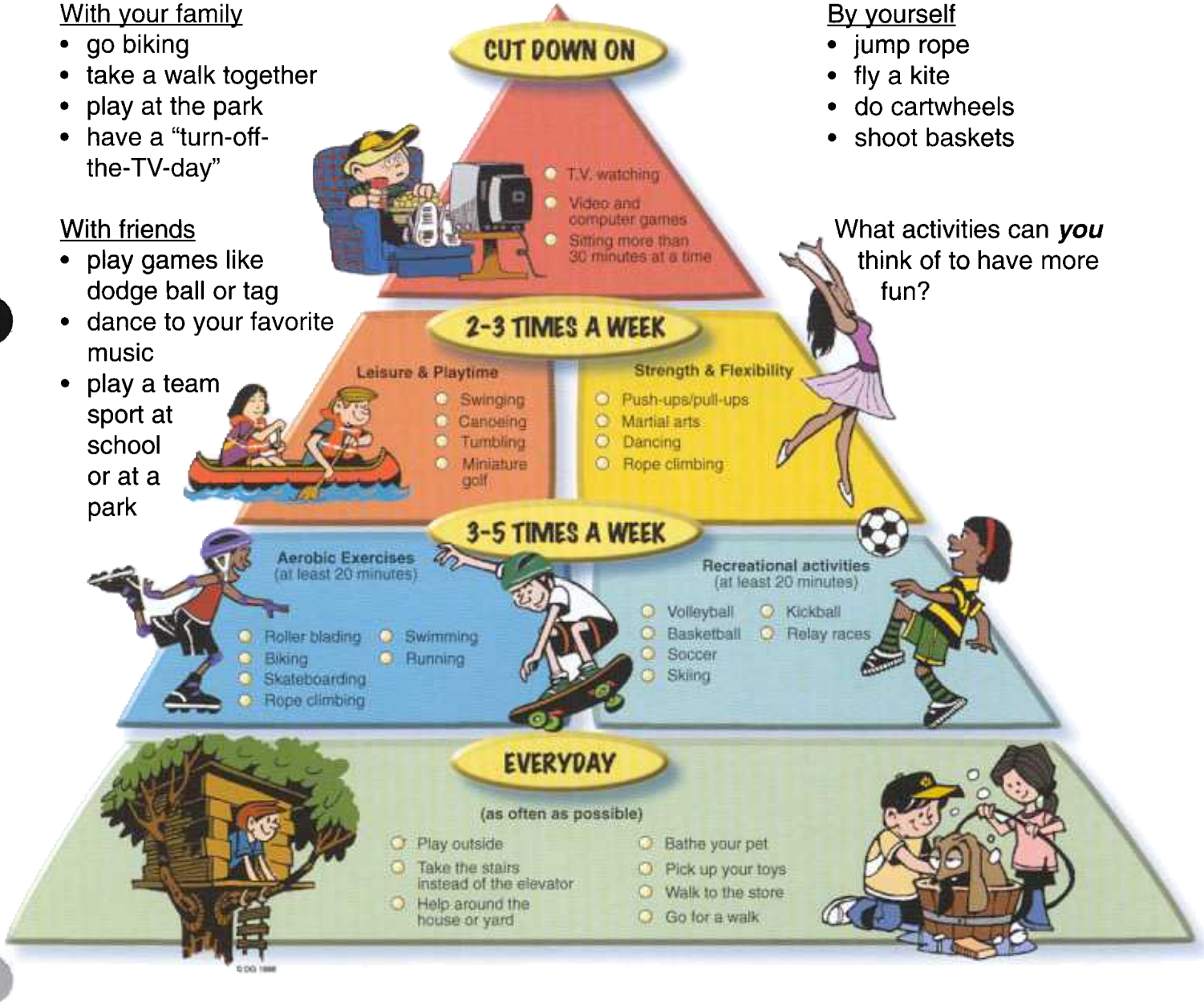
Have FUN and be active each week by trying some of these activities...

With your family
- go biking
- take a walk together
- play at the park
- have a "turn-off-the-TV-day"

With friends
- play games like dodge ball or tag
- dance to your favorite music
- play a team sport at school or at a park

By yourself
- jump rope
- fly a kite
- do cartwheels
- shoot baskets

What activities can ***you*** think of to have more fun?



Jointly funded by USDA Expanded Food and Nutrition Program and Family Nutrition Programs

My Own Activity Pyramid

Hey, kids!

This is your own personal physical activity pyramid. List your physical activities for a week.

Or draw and color a picture of you doing your activity in the correct space.

Tip for parents!

You can encourage your children to be more active by making time for physical activities as a family.

Families that play together stay healthier together!

OUTREACH & EXTENSION
UNIVERSITY OF MISSOURI COLUMBIA

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N 386

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Insulin and Insulin Therapy

I. INDICATIONS
Always used in patients with type 1 diabetes or DKA (diabetic ketoacidosis) and may be required in patients with type 2 or gestational diabetes

II. MECHANISM OF ACTION:
Transports glucose into cells, promotes glycogen storage, and inhibits fat and protein breakdown

III. SOURCES:
A. Human insulin, insulin analog: recombinant DNA technology
B. Porcine insulin

IV. PREPARATIONS:
A. Strength: U-100 (in the U.S.)
B. Type and Action (see Insulin Action Times - page 82 - for description)

V. ABSORPTION OF INSULIN:
May vary with each patient because of:
A. Source of insulin: porcine or human (porcine insulin tends to have a longer duration of action)
B. Manufacturer: Eli Lilly or Novo Nordisk (avoid alternating manufacturers)
C. Injection site: abdomen, arm, thigh, buttocks (listed in order of most rapid absorption)
D. Temperature: cold insulin is absorbed more slowly
E. Exercise or massage of injection site increases rate of absorption

VI. DOSING:
A. Attempt to mimic body's normal secretion of insulin

B. Examples of individualized insulin regimens
   1. Intermediate- or long-acting insulin daily or twice daily
   2. Intermediate- or long-acting insulin mixed with rapid- or short-acting insulin twice daily.
   3. Short- or rapid-acting insulin three times daily during the day and intermediate- or long-acting insulin at bedtime.
   4. Long- or intermediate-acting insulin twice daily and short- or rapid-acting insulin with meals
   5. Insulin-pump basal rates and premeal and supplemental boluses

VII. TIME OF ADMINISTRATION:
A. Will vary depending on type of insulin (e.g., lispro & aspart are given within 5-15 minutes of meal; all other insulins are given approximately 30 minutes prior to meal)
B. May also vary according to blood glucose result (e.g., if glucose is >200mg/dl (11.1 mmol/l), administer injection and wait 45-60 minutes before eating; if glucose is <80mg/dl (<4.4 mmol/l), first treat appropriately, then give insulin at time of meal or after eating)

VIII. EQUIPMENT:

A. Syringe (1/4 cc, 3/10 cc, ½ cc, 1 cc; short needles available for children and thin adults)
B. Pen injector
C. Pump

IX. INSULIN ADMINISTRATION GUIDELINES:

A. Preparation, single dose
   1. Wash hands
   2. Be sure insulin is at room temperature before using (may warm prepared syringe between hands)
   3. Clean rubber stopper with alcohol
   4. If using cloudy insulin, roll vial to mix, do not shake
   5. Draw air into syringe equal to the amount of insulin being withdrawn (equalizes pressure)
   6. Insert needle into stopper
   7. Inject air into vial
   8. Invert vial
   9. Fill syringe with insulin
   10. Clear air bubbles
   11. Check dose before administering

B. Preparation, mixed dose
   1. Wash hands
   2. Be sure insulin is at room temperature before using (may warm prepared syringe between hands)
   3. Clean rubber stopper with alcohol
   4. If using cloudy insulin, roll vial to mix, do not shake
   5. Inject air into cloudy insulin first, then remove needle
   6. Draw air into syringe again
   7. Inject air into clear vial again
   8. Invert vial
   9. Fill syringe with clear insulin first
   10. Clear air bubbles
   11. Check dose
   12. Invert cloudy vial
   13. Fill syringe with cloudy insulin to a combined total of clear and cloudy insulin
   14. Check dose before administering

C. Injection Sites (from the order of most rapid to slowest absorption
   1. Abdomen has best absorption and is preferred site
   2. Upper arm and outer aspect (not deltoid)
   3. Thigh
   4. Buttocks/flank

D. Technique
   1. Wipe skin with alcohol and allow to dry
   2. Pinch skin
   3. Insert needle slowly at 90 degree angle all the way to hub of syringe; use 45 degree angle for ½ inch needle or use short needle if patient is thin or a child
   4. Gradually release pinch as insulin is being injected
   5. Pull needle out at same angle as inserted (do not rub injection site after removal of needle)

X. STORAGE:

A. Refrigerate unopened insulin (will be good until the expiration date on the vial)
B. If using vial of insulin within 30 days of opening; may store at room temperature (>36º F and <86º F); insulin expires after 30 days at room temperature.

XI. MIXING INSULINS:

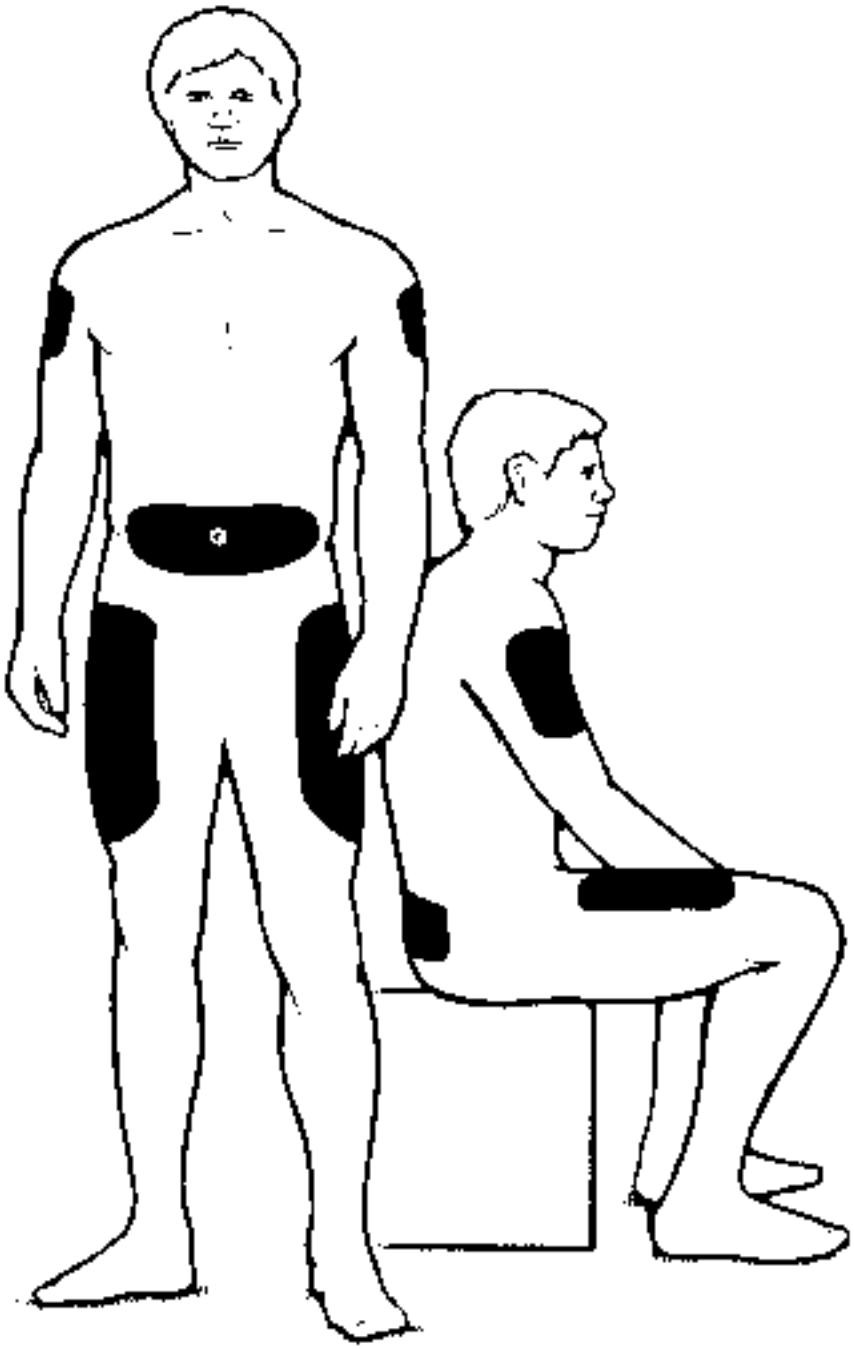
A. NPH and short-acting insulin formulations when mixed may be used immediately or stored for up to 2 weeks
B. Mixing of regular and lente is not recommended unless injected immediately after preparation; binding action of regular and lente begins immediately and effect of regular may be blunted
C. Phosphate-buffered insulin (i.e., NPH and Velosulin) should not be mixed with lente
D. Velosulin BR and NPH can be mixed

XII. COMPLICATIONS OF INSULIN ADMINISTRATION:

A. Hypoglycemia
B. Allergic reaction (local/systemic)
C. Lipohypertrophy (thickening of subcutaneous fat at injection site)
D. Lipoatrophy (thinning of subcutaneous fat at injection site)

Adapted from: Ballard AM, 2000. *Insulin and Insulin Therapy*. The Diabetes Ready-Reference Guide for Health Care Professionals. American Diabetes Association.©

Injection Sites



Adapted from: Funnell MM, Arnold MS, Barr PA, Lasichak AJ 2000. *Injection Sites*. "Life With Diabetes". American Diabetes Association, p191.

Insulin Action Times

There are three characteristics of insulin. These are:

Onset – the length of time before insulin reaches the bloodstream and begins lowering blood sugar.

Peak Time – The time during which insulin is at its maximum strength in terms of lowering blood sugar levels.

Duration – How long the insulin continues to lower blood sugar.

Storage and expiration dates also need to be taken into consideration.

Storage - Opened vials may be left at room temperature for 28-30 days after opening, or as indicated on package. Avoid exposure to extreme temperatures. Unopened vials should be stored in the refrigerator and are good until the expiration date on the package.
NOTE: Lantus must be refrigerated at all times, whether vials are opened or unopened.

Expiration Date - Make sure that the insulin that is supplied will be used before its expiration date.

Below you will find a table describing the insulin types with their comparative action times.

Types of Insulin by Comparative Action

Animal or Human	Insulin Type	Onset	Peak (Hours)	Usual Effective Duration (Hours)	Usual Maximum Duration (Hours)
Animal	regular	0.5 – 2 hours	3 – 4	4 – 6	6 – 8
	NPH	4 – 6 hours	8 – 14	16 – 20	20 – 24
Human	insulin aspart	5 – 10 minutes	1 – 3	3 – 5	4 – 6
	insulin lispro	< 15 minutes	.5 – 1.5	2 – 4	4 – 6
	regular	0.5 – 1 hour	2 – 3	3 – 6	6 – 10
	NPH	2 – 4 hours	4 – 10	10 – 16	14 – 18
	lente	3 – 4 hours	4 – 12	12 – 18	16 – 20
	ultralente	6 – 10 hours	---	18 – 20	20 – 24
	insulin glargine	1.1 hours	---	24	24

Please Note: Types of insulin are listed in more detail in the Reference Section at the back of this manual.

Adapted from: *Diabetes Forecast*, 2004 Resource Guide, Volume 57, Number 1, Pages RG 16-17. "Diabetes in Children A Resource Guide for School Personnel", 2002, Illinois Department of Human Services. http://www.iasn.org/diabetes.pdf.

Insulin Delivery Systems

Syringes…pens…pumps…inhaled insulin…they all do the same thing - deliver insulin. These items deliver insulin into the tissue so it can be used by the body. This category also includes injection aids - products designed to make giving an injection easier.

Syringes
Today's syringes are smaller and have finer needles and special coatings that work to make injecting as easy and painless as possible. When insulin injections are done properly, most people discover they are relatively painless.

Points to Consider for Optimal Insulin Delivery by Syringe
- The syringe being used should be the right size for the insulin dose.
- It should be easy to draw up and visualize the dosage (devices are available to make this task less complicated).
- Shorter, smaller needles are available which allow for ease of administration.

Insulin Pens
There is a wide range of insulin pen options available. The pens can be an excellent option when children need a single kind of insulin. They can make taking insulin much more convenient. Some children find the pen needles make injection more comfortable.

Pumps
Insulin pumps are computerized devices, about the size of a beeper or pager, which you can wear on your belt or in your pocket. They deliver a steady, measured dose of insulin through a cannula (a flexible plastic tube) with a small needle that is inserted through the skin into the fatty tissue. The cannula is taped in place - not the needle. Insulin pumps may be worn during most athletic activities.

The pump may be placed on one of several sites on the body, including the abdomen, buttocks, thigh, or arm.

Advantages of the Pump
- Greater flexibility of meals, exercise, and daily schedule
- Improved physical and psychological well being
- Smoother control of blood glucose level
- Lower glycosylated hemoglobin

Disadvantages of the Pump
- Risk of infection at catheter site
- More frequent hypoglycemia
- Risk of ketosis and ketoacidosis
- Constant reminder of diabetes

Responsibilities of Pump Wearer
- Must be willing to test blood sugar a minimum of 4 times/day
- Must learn how to make adjustments in insulin, food, and exercise in response to those test results
- Must respond to blood sugar readings
- Troubleshooting pump for high or low blood sugars readings
- Keep back up insulin, syringe or pen, and pump supplies available at school and home

Inhaled Insulin
Inhaled insulin is a new type of insulin delivery system that has recently completed clinical trial testing. Though the product has not had final approval by the FDA for public marketing, some children are currently using this insulin delivery system from their trial participation.

Information will be forthcoming on the advantages and disadvantages of inhaled insulin, once it has completed FDA approval.

Adapted from: "Children with Diabetes: A Resource Guide for Schools", 2001, New York State Department of Health.

Insulin Pumps in the School Setting

A student in your school has diabetes and is on an insulin pump. An insulin pump is a device that continuously infuses a very small amount of fast-acting insulin through a small catheter under the skin. The student then takes additional insulin through the pump for meals and snacks. We would like to emphasize that problems and complications with insulin pumps are very seldom seen. For the most part, you will not be aware that the student is using the pump, although you may hear an occasional quiet beep or click when insulin is being dispensed by the pump. The following information may assist you in helping the student wearing an insulin pump.

Blood Sugar Testing

When a student is on an insulin pump, more frequent blood sugar testing may be necessary. If the testing can be done in the classroom, which would be preferred, as the student will miss less classroom time. Testing can also be done in the office or clinic if necessary.

Low Blood Sugar

If a student who is on an insulin pump experiences a low blood sugar reaction, these guidelines should be followed:

- ✓ If the blood sugar is between 50-70mg/dl, the student needs to take about 15 grams of carbohydrate, which is the equivalent to 4 oz. of juice, 3-4 glucose tablets, or 4 oz. of regular pop.
- ✓ If the blood sugar is less than 50mg/dl, the student may need to eat as much as 30 grams of carbohydrate (15 grams of one of the above in addition to 15 grams of a small snack, i.e., cheese crackers, or a granola bar).
- ✓ If the student should experience a severe low blood sugar where the student is unconscious or is having a convulsion, 911 should be called or Glucagon may be given by appropriately trained staff. **The pump should not be removed and the pump dosage should not be adjusted in any way.**

High Blood Sugars

High blood sugars over 300mg/dl may be an early indication that the pump is not infusing the insulin as it should or that the child is ill. If the student's blood sugar is over 300dl at mealtime, urine ketones should be checked. If the urine ketones are negative, the student can give an additional insulin dose through the insulin pump along with the usual lunch insulin dose. The student should then recheck a blood sugar in 1 hour to be sure it is coming down. If the blood sugar is above 300mg/dl and the ketones are small, moderate, or large, the student will need to be given an insulin dose with a syringe and drink 8 oz. of water an hour until the ketones disappear. The student will also have to change the infusion site and tubing for the insulin pump. The student should have a vial of fast-acting insulin and insulin syringes available in the clinic in case they need to give an additional injection.

- continued on back -

Exercise

During times of vigorous exercise, the student may need to disconnect from the pump. For this, the student needs to place the pump in a safe place where it will not be damaged. During prolonged exercise, many students reconnect the pump periodically and take insulin. Some students wear their pump during exercise and use a special case to protect it.

Questions?

If you have any questions, speak with the student and the student's family. They can be a tremendous resource for you. You may also contact the pump manufacturer for resource information for school health personnel.

Guidelines for Troubleshooting Insulin Pumps in the School

Any child with diabetes is at risk for both hypoglycemia (low blood sugar level) and for hyperglycemia (extreme high blood sugar levels) with or without ketones. This is no different for a child who wears an insulin pump. It is important for school personnel to know how to treat these two problems if they should occur. The pump does not need to be disconnected.

Hypoglycemia (Low Blood Sugar)

- Symptoms may occur rapidly with or without noticeable signs and symptoms.
- Symptoms may vary from child to child and from one episode to another.
- There may be time when hypoglycemia occurs without an apparent cause.
- If symptoms are left untreated, they may progress to the inability to eat or drink, unconsciousness, tremors or seizure.

Possible causes of **Hypoglycemia**:

- Increased activity
- Delayed or skipped meal
- Inadequate meal
- Too much insulin

Common Signs and Symptoms of **Hypoglycemia**:

- Pale
- Shaky
- Sweaty
- Cranky/Irritable
- Sleepy
- Hungry
- Confusion
- Headache
- Dizziness

Potential Causes of Hypoglycemia With Insulin Pump

Possible Cause	Action
Insulin Pump ■ Basal rate programmed incorrectly ■ Clock time incorrect on display	■ Check times and basal rates ■ Reset clock
Food Intake ■ Bolus too large ■ Improper timing of insulin bolus	■ Check bolus amounts and times ■ Match timing of insulin with bolus Check blood glucose before meal

(list continued on next page)

Potential Causes of Hypoglycemia With Insulin Pump
(continued)

Possible Cause	Action
Activity ■ Did not activate suspend or a temp basal rate ■ Food intake not adequate to accomodate exercise. ■ Unplanned activity	■ Consult with health care professional for guidelines to temporarily decrease rate for exercise ■ If not decreasing insulin for exercise, must eat carb containing food prior to exercise ■ Must check blood glucose prior to activity ■ Effects of exercise may be present for several hours after the exercise
Self-Monitoring of Blood Glucose ■ Infrequent blood glucose testing ■ Hypoglycemia unawareness	■ Check blood glucose a minimum of four times per day ■ May need to raise blood glucose goals

TREAT HYPOGLYCEMIA IMMEDIATELY!!

Use "Rule of 15"

Consume 15 grams of fast-acting carbohydrate
Wait 15 minutes
Recheck blood glucose
If blood glucose is <90 mg/dl, repeat above steps.*

THERE IS NO NEED TO DISCONNECT PUMP!!

If a child cannot take food by mouth, give GLUCAGON by injection. Turn the child on his/her side to prevent aspiration in the event of vomiting.

Treat the condition first, and then call the **medical team** and the parents. The school's plan of care should indicate how hypoglycemic epidsodes are to be reported to a parent.

Since eating disorders can be a problem, the student should be referred back to the registered dietitian and primary provider if a pattern becomes apparent. At point of service, the student should be counseled about adequate intake and carrying a sugar source.

*While 90 mg/dl is certainly not considered low blood sugar, due to the volatility of blood glucose levels in type 1 children related to changes in activity and variations in insulin absorption, 90 can drop to <60 very quickly.

Hyperglycemia (High Blood Sugar)

- High blood sugar occurs due to an imbalance of food, exercise and insulin. Although not desirable, there is no immediate problem caused by mild hyperglycemia.
- This could happen in any child or teen with diabetes.

Possible causes of **Hyperglycemia**:

- Illness
- Too much food
- Not enough insulin
- Decreased activity
- Increase in hormones
- Rebound from low blood glucose level

Common Signs and Symptoms of **Hyperglycemia**:

- Increased thirst
- Frequent urination
- Fatique
- Blurred Vision

Potential Causes of Hyperglycemia With Insulin Pump

Possible Cause	Action
Infusion Site/Set*	
■ Redness, irritation at site	■ Change infusion site/set
■ Bump or nodule at infusion site	■ Rotate site, avoid these areas
■ Needle inserted in area of friction	■ Avoid waistline and friction areas
■ Air in tubing	■ Prime air out of tubing
■ Luer lock connection between cartridge/ reservoir not tight	■ Check connection
■ Insulin leakage at site	■ Change site
■ Not changing cannula every 2-3 days	■ Remember to bolus to fill cannula after site change
Insulin Pump	
■ Basal rate programmed incorrectly	■ Check times and rates
■ Pump is in SUSPEND	■ Take pump out of SUSPEND
■ Pump malfunction	■ Call pump manufacturer customer service
■ Pump alarms	■ Identify alarms, take action as outlined in User Manual
■ Time/date programmed incorrectly	■ Change cartridge/reservoir and infusion set
■ Occlusion alarm	■ Change batteries
■ Dead battery	■ Fill new cartridge/reservoir
■ Cartridge/reservoir empty	

*** Site should be changed every 2-3 days or as recommended by health care professional. Notify health care professional with signs or symptoms of infection.**

(list continued on next page)

Potential Causes of Hyperglycemia With Insulin Pump
(continued)

Possible Cause	Action
Food Intake ■ Bolus insufficient or omitted ■ Improper timing of insulin bolus	■ Need to count carbohydrates ■ Consult healthcare professional
Activity** ■ Blood glucose >240 with ketones before exercise	■ Blood glucose will increase with exercise when ketones are present

****Do not exercise with ketones. Consult healthcare professional for exercise guidelines.**

The treatment of high blood sugar in a student with an insulin pump is to give a correction bolus, temporarily increase the basal rate, or possibly, exercise. If there is a pattern of high blood glucose at certain times of the day, the parent or clinician should be notified. If a pattern emerges, refer the student back to the registered dietitian to review carb sources and portion sizes.

SMART PUMPERS TIP
When in doubt, change it out!!

For unexplained high blood glucose (>240 mg/dl two times in a row), change the cartridge/reservoir and infusion site and set; check the urine for ketones; and take fast acting insulin by syringe as directed by the health care professional.

Diabetic Ketoacidosis (DKA)

Ketones are produced when there is insufficient insulin. The body begins to break down body fat that produces ketones. As ketones increase in the blood and urine, the body becomes acidic, thus leading to a condition called Diabetic Ketoacidosis (DKA),

Symptoms of DKA may include:

- ✓ Moderate or large amounts of ketones in the blood and urine
- ✓ Nausea, vomiting, stomach pain
- ✓ Labored breathing
- ✓ Fruity breath
- ✓ Weakness
- ✓ Mental sluggishness, slowness to respond
- ✓ Loss of consciousness, coma

Source: The information in this section was obtained from Tricia Green, RN, CPNP, CDE with Animas Corporation and from *Pumper in the School*, a publication by MiniMed.

Insulin Pump Manufacturer Contacts:

Animas Corporation **1-877-YES-PUMP**
Disetronic Medical Systems, Inc. **1-800-280-7801**
Nipro Diabetes Systems, Inc. **1-888-647-7698**
Deltec, Inc. **1-800-826-9703**
Medtronic MiniMed **1-800-MINIMED**
Dana Diabecare USA **1-866-DANATEC**

Disposing of Sharps Safely

Millions of individuals with serious health conditions manage their care at home. For example, people with diabetes use syringes and lancets to test their blood sugar every day. All this creates a lot of medical waste. What's the best way to handle this waste?

The best way to protect trash handlers and sewage treatment workers against disease and injury, and avoid attracting drug abusers looking for syringes to reuse, is to follow these guidelines for containment and disposal of sharps.

Containment

- Contain the sharps in your own home.
- Use a puncture-proof plastic container with tight-fitting screw top. A bleach bottle is good. Don't use glass because it can break. Coffee cans are not recommended because the plastic lids come off too easily. A red sharps container may be purchased at local pharmacies as well.
- Label the container clearly. Write "Contains Sharps" with a waterproof marker directly on the container or on masking tape on the container.
- Once a syringe or lancet is used, immediately put it into a container. Screw on the top. Don't clip, bend or recap the needles because of potential injury to yourself.
- Keep the container away from children!
- When the container is full, screw on the cap tightly. Seal it with heavy-duty tape to be extra safe.

Disposal

There are different options for getting rid of the container of sharps. Some cities and towns have more options than others do. Here are the best ways for safety, health, and protection of the environment.

- Call local doctors, pharmacies, clinics, local hospitals, or nursing homes and ask if they accept properly contained sharps for disposal. Ask local diabetes educators or local American Diabetes Association office about sharps disposal programs.
- Call local public works department or solid waste manager. (Check the blue pages of the telephone book for their numbers.) Some communities have special household medical waste collection or drop-off days.
- Call local health departments and ask about special household medical waste disposal programs.

Consult your local department of public works for information about laws applying to disposal of household sharps along with household trash.

Oral Agents for Type 2 Diabetes

Drug Class	Generic Name	Trade Name	When to take	Usual Dosage	Max. Dosage	Peak	Duration	Side Effects
Alpha-Glucosidase	**Slows down carbohydrate absorption in intestines**							
	Acarbose	Precose	With first bite of food	25mg 3 X day	100 mg 3 X day	1 hr.	2-4 hr.	Abd. Pain Diarrhea Flatulence
	Miglitol	Glyset	With first bite of food	25 mg 3 X day	100 mg 3 X day	2-3 hr.	Unknown	Same as above
Biguanides	**Decreases hepatic glucose production**							
	Metformin	Glucophage	With Meals	500 mg 3 X day	850 mg 3 X day	UNK	Unknown	Diarrhea Nausea/vomiting Metallic Taste in Mouth
	Meformin (long acting)	Glucophage XR	With Meal	500 mg daily	2000 mg daily	UNK	Unknown	Same as Above
Meglitinides	**Stimulates insulin release from pancreas**							
	Nateglinide	Starlix	10 min. before meals	120 mg 3 X day	None given	1-2 hr.	4 hrs.	Gastric Upset Rash Upper Resp. Inf.
Sulfonylureas	**Stimulates insulin release from pancreas**							
	Repaglinide	Prandin	30 mins. Before meals	0.5 mg 2-4 X daily	4 mg 2-4 X daily	1 hr.	Unknown	Ischemia
	Acetohexamide	NONE listed	Before meals	250 mg daily	1500 mg daily	3 hr.	12-24 hr.	Ischemia
	Chlorpropamide	Diabinese	With Breakfast	250 mg daily	750 mg daily	2-4 hr.	24 hr.	Leukopenia
	Glimepiride	Amaryl	With first Meal	1-2 mg daily	8 mg daily	2-3 hr.	> 24hr.	Same as Above
	Glipizide	Glucotrol	Before Breakfast	5 mg daily	15 mg daily	1-3 hr.	4 hr.	Same as Above

(continued on page 88a)

(continued from page 88)

Drug Class	Generic Name	Trade Name	When to take	Usual Dosage	Max. Dosage	Peak	Duration	Side Effects
Sulfonylureas - continued	Glipizide (long acting)	Glucotrol XL	Before Breakfast	5 mg daily	20 mg daily	6-12 hr.	24 hr.	Same as Above
	Glyburide	DiaBeta, Micronase	With Breakfast	1.25 mg daily	20 mg daily	4 hr.	24 hr.	Same as Above
	Glyburide (micronized)	Glynase Pres Tab	With Breakfast	0.75 mg daily	12 mg daily	4 hr.	24 hr.	Same as Above
	Tolazamide	Tolinase	With Breakfast	100 mg daily	1000 mg daily	4-6 hr.	14-16 hr.	Same as Above
	Tolbutamide	Orinase	Take in Morning	1 gram daily	3 grams daily	1 hr.	5-8 hr.	Same as Above
Thiazolidine-diones (TZDs)	**Improves peripheral insulin sensitivity**							
	Pioglitazone	Actos	Once Daily	15 mg daily	30 mg daily	2 hr.	Unknown	Headache Edema Anorexia
	Rosiglitazone	Avandia	Take in Morning	4 mg daily	8 mg daily	1 hr.	Unknown	Same as Above
Combination Pills								
	Metformin + Glyburide	Glucovance	With Meals	1.25/250 mg. daily	20/2000 mg daily	2 weeks	Unknown	Headache Dizziness
	Metformin + rosiglitazone	Avandamet	With Meals	1/500 mg daily	8/2000 mg daily	1 hr.	Unknown	Headache Diarrhea
	Metformin + Glipizide	Metaglip	With Meals	2.5/250 mg daily	5/500 mg daily	UNK	Unknown	Headache Diarrhea Hypertension Dizziness N & V

Adapted from: *Diabetes Forecast,* 2004 Resource Guide, Volume 57, Number 1, Page RG 13.

Effects of Over-the-Counter and Prescription Medications on Diabetes Control

I. Drugs that may Alter Glycemic Effect of Sulfonylureas

A. Enhance hypoglycemic effect (decrease blood glucose)

1. Alcohol (acute use)
2. Allopurinol (Zyloprim)
3. Androgens
4. Anticoagulants (Coumadin)
5. Chloramphenicol
6. Clofibrate (Atromid-S)
7. Fenfluramine
8. Fluconazole
9. Gemfibrozil
10. Histamine H_2 antagonists (Pepcid, Tagamet, Zantac)
11. Magnesium salts
12. Methyldopa
13. Monoamine oxidase (MAO) inhibitors (Nardil, Parnate, Marplan)
14. Phenobarbital (Donnatal)
15. Phenylbutazone
16. Probenecid
17. Salicylates (aspirin, Disalcid, Dolobid)
18. Sulfinpyrazone
19. Sulfonamides, (Bactrim, Gantrisin, Septra)
20. Tricyclic antidepressants (Elavil, Pamelor, Tofranil, Triavil)
21. Urinary acidifiers

B. Decrease hypoglycemic effect (increase blood glucose)

1. Alcohol (chronic use)
2. Beta-blockers (can have either hypo or hyperglycemic effect)
3. Cholestyramine
4. Diazoxide (Proglycem)
5. Diuretics (Diuril, Hydrodiuril, Lasix, Lozol)
6. Hydantoin (Dilantin)
7. Rifampin
8. Urinary alkalinizers
9. Charcoal

II. Drugs that Interact with Insulin

A. Enhance hypoglycemic effect (decrease blood glucose)

1. Angiotensin-converting enzyme (ACE) inhibitors
2. Alcohol
3. Anabolic steroids
4. Beta-blockers (delay recovery from hypoglycemia)
5. Calcium
6. Chloroquine
7. Clofibrate
8. Fenfluramine
9. Guanethidine
10. Lithium carbonate
11. MAO inhibitors
12. Mebendazole
13. Octreotide
14. Pentamidine
15. Phenylbutazone
16. Pyridoxine
17. Salicylates
18. Sulfinpyrazone
19. Sulfonamides
20. Tetracyclines

B. Decrease hypoglycemic effect (increase blood glucose)

1. Acetazolamide
2. AIDS antivirals
3. Asparaginase
4. Calcitonin
5. Contraceptives, oral
6. Corticosteroids
7. Cyclophosphamide
8. Dextrothyroxine
9. Diazoxide
10. Dilitiazem
11. dobutamine
12. Epinephrine
13. Estrogens

14. Ethacrynic acid
15. Isoniazid
16. Lithium carbonate
17. Morphine sulfate
18. Niacin
19. Phenothiazines
20. Nicotine
21. Thiazide diuretics
22. Thyroid drugs

III. RULES FOR PATIENT USE

A. ALWAYS read the medication label (take note of caution and warning labels)
B. ASK your pharmacist when in doubt about interaction of medications.
C. AVOID medication products containing sugar (corn syrup, dextrose, glucose, sucrose, and fructose).
D. AVOID medication products containing alcohol; if consumed, the smaller the percentage the better.
E. AVOID salicylates in large doses unless prescribed by physician.

Ballard AM, 2000. *Medication Effects*. The Diabetes Ready-Reference Guide for Health Care Professionals. American Diabetes Association.©

Monitoring Glucose Control

I. Self-Monitoring of Blood Glucose (SMBG)

A. Critical element in management of diabetes

B. Note for comparing plasma, whole-blood (capillary), and venous glucose:
Serum and plasma glucose levels measured in most clinical labs can be 10-15% higher than whole-blood levels measured by some home monitoring equipment.

C. Methods
Blood glucose meter: usually performed by placing droplet of whole blood on reagent strip. Meter then provides a digital glucose reading. Meters available in wide variety of models and price ranges. Results may be influenced by hematocrit, altitude, temperature, and use of oxygen.

II. Frequency of Testing

A. Determining factors

1. Type of diabetes
2. Levels of control preferred
3. Ability to perform test independently
4. Affordability
5. Willingness to test (i.e., at school, work, etc.)

B. General Guidelines

1. Type 1: four times/day before meals and bedtime
2. Type 2: as needed to achieve glycemic goals
3. Gestational Diabetes (GDM): fasting and 1-2 hours after meals
4. Physical activity: before and after to determine effect on metabolic control (in type 1 and type 2 if needed)
5. Hypoglycemia: determine presence of hypoglycemia and response to treatment
6. Illness: every 4-6 hours
7. Insulin pump or intensive management: four or more times/day

III. Normal and Target Plasma Blood Glucose Levels (mg/dl)*

Biochemical Index	Normal	Goal	Additional Action Suggested
Average preprandial glucose (mg/dl)†	70-110	90-130	<90
Average postprandial glucose (mg/dl)†	70-140	<180	
A1C (%)	<6	<7	>8

* The values shown in this table are by necessity generalized to the entire population of individuals with diabetes. Patients with co-morbid disease, the very young, older adults, and others with unusual conditions or circumstances may warrant different treatment goals. These values are for nonpregnant adults. "Additional action suggested" depends on individual patient circumstances. Such actions may include enhanced diabetes self-management education, co-management with a diabetes team, referral to an endocrinologist, change in pharmacological therapy, initiation of or increase in SMBG, or more frequent contact with the patient. A1C is referenced to a nondiabetic range of 4.0-6.0% (mean 5.0%, SD 0.5%).

† Measurements of capillary blood glucose.

IV. Glycated Hemoglobin (A1C)

A. Indicates blood glucose control over a period of approximately 3 months.
B. Normal range varies depending on method lab uses; usually 4-7%, correlating to average blood glucose of 60-150mg/dl (-3.3-8.3 mmol/l).
C. Should be ordered by health care provider every 3 months for type 1 diabetes and 3-6 months for type 2 to help determine overall control.
D. Patient does not need to be fasting to have this blood test performed.

V. Fructosamine Test (Glycated Serum Protein [GSP])

A. Reflects blood glucose control over preceding 7-10 days.
B. May be used as a means of monitoring women during pregnancy, when more frequent determinations of control are essential.

VI. Urine Ketone Testing

A. Ketones: by-product of fat metabolism; presence indicates body is not metabolizing food properly because of lack of available insulin or carbohydrate; may indicate impending or established diabetic ketoacidosis (DKA), a condition that requires immediate medical attention.
B. Method: Ketone strips
   1. Strips are read by comparing the test color to a standard color chart.
   2. Factors such as handling the color pad with your hands or placing test materials on a counter recently cleaned with bleach can cause inaccurate results
   3. Be aware of expiration dates; the strips are good only for a specified time, usually 3–6 months. When a bottle of strips is opened, date it and note expiration date.

C. When to Test
   1. When blood glucose level is consistently >240mg/dl (13.3 mmol/l)
   2. Before exercise. Do not exercise if blood glucose is >240 mg/dl and ketones are present.
   3. During periods of acute illness (illness is a stress that can cause hyperglycemia)
   4. When symptoms of hyperglycemia accompanied by nausea, vomiting, and abdominal pain are present.

Here are additional resources you might find useful:

- "Diabetes in Children A Resource Guide for School Personnel", 2002, Illinois Department of Human Services. http://www.iasn.org/diabetes.pdf
- National Institutes of Diabetes and Digestive and Kidney Diseases (NIDDK), Hypoglycemia: http://www.diabetes.niddk.nih.gov/dm/pubs/hypoglycemia

Adapted from: Ballard AM, 2000. *Monitoring Glucose Control*. The Diabetes Ready-Reference Guide for Health Care Professionals. American Diabetes Association.©

Recommended Guidelines for Blood Glucose Control

Students with diabetes need to obtain a blood glucose level and to respond to the results as quickly and conveniently as possible. This is important to avoid medical problems being worsened by a delay in testing/treatment and to minimize educational problems caused by missing instructions in the classroom.

To maximize instructional time, a student should be allowed to check his or her blood glucose level and take appropriate action to treat hypoglycemia. This applies to the classroom or anywhere the student is in conjunction with a school activity, if preferred by the student and indicated in the student's Individualized Health Plan. However, some students prefer to test their blood glucose in private and their privacy should be respected.*

See the table below for Recommended Guidelines for Blood Glucose Control. Blood glucose values less than 90 are considered low and should be monitored. When you schedule appointments with your physicians or your dietitian, remember to bring a logbook containing two weeks of blood glucose values to each appointment.

The "Take Action" column implies a possible insulin or food adjustment. We recommend keeping a log of three to five days of blood glucose values to identify a pattern of consistent high blood glucose before calling for an insulin adjustment. If blood glucose is consistently low, call for an insulin adjustment.

Dietitians recommend reviewing food intake and carbohydrate counting skills to make sure inconsistent eating is not the cause of varying blood glucose values. Checking food portions with measuring cups is helpful.

Remember, unless you are on Multiple Daily Injections (three shots per day) or an Insulin Pump, you should have a consistent carbohydrate meal plan to follow.

Summer exercise and activities may also influence blood glucose. A rule of thumb is to take one extra carbohydrate (15 grams) for each 30-45 minutes of more strenuous activity in addition to the current meal plan.

* Source: "Diabetes Care in the School and Day Care Setting". *Diabetes Care*, Volume 27, Supplement 1, Pages S122-S128, January 2004.

Recommended Guidelines for Blood Glucose Control

NOTE: Ranges may vary according to individual needs

	Plasma Monitor Values		**Whole Blood Monitor Values**	
When	**Goal BG**	**Take Action**: If BGs are out of range 2-3 days in a row	**Goal BG**	**Take Action**: If BGs are out of range 2-3 days in a row
Before meals (Kids 5 years and older)	90-130	Less than 90 or greater than 150	80-120	Less than 80 or greater than 140
Kids under 5 years	100-200	Less than 100 or greater than 200	100-200	Less than 100 or greater than 200
2 hrs after meals (MDI or Pumps)	Within 40 of premeal BG but less than 180	If less than or greater than 40 of premeal BG	Within 40 of premeal BG but less than 180	Less than or greater than 40 of premeal BG

Adapted from: "Shot Talk" produced by Children's Mercy Hospital & Clinics, The Children's Diabetes Center – Summer, 2001

Proper interpretations of A1C test results requires that health care providers understand the relationship between test results and average blood glucose, kinetics of the A1C test, and specific assay limitations. Data from the Diabetes Control and Complications Trial (DCCT) relating A1C test results to mean plasma glucose levels appear in Table 1, but this data should be used with caution if the A1C test assay method is not certified as traceable to the DCCT reference method.

Table 1. Correlation Between A1C Level and Mean Plasma Glucose Levels

	Mean Plasma Glucose	
A1C (%)	mg/dl	mmol/l
6	135	7.5
7	170	9.5
8	205	11.5
9	240	13.5
10	275	15.5
11	310	17.5
12	345	19.5

Source: American Diabetes Association, Diabetes Care, Volume 26, Supplement 1, January 2003.

Blood Glucose Monitors

Below is a list of Blood Glucose Monitors. For a complete list of Blood Glucose Monitors and Data Management Systems, please visit the American Diabetes Association's 2004 Resource Guide at: http://www.diabetes.org/uedocuments/monitors-tables.pdf

Plasma Meters		
Accu-Check Active	BD latitude Diabetes	Presitge IQ
Accu-Check Advantage	BD Logic	Presige LX
Accu-Check Compact	FreeStyle	Precision Sof-Tact
Accu-Check Complete	FreeStyle Flash	Precision Xtra
Accu-Check Voicemate	FreeStyle Tracker	QuickTek
Ascensia Breeze System	Hypoguard Advance	Supreme II
Ascensia DEX 2	OneTouch InDuo	TrueTrack Smart System
Ascensia Elite	OneTouch SureStep	
Ascensia Elite XL	OneTouch Ultra	
Assure	OneTouch UltraSmart	
Assure II	Focus Blood Glucose Montoring System	

Whole Blood Meters			
One Touch Profile	One Touch Basic	One Touch II	ReliOn

Adapted from: *Diabetes Forecast,* 2004 Resource Guide, Volume 57, Number 1, Pages RG 40-47.

From The School Nurse
Subject: Diabetes

Diabetes is **NOT** an infectious disease. It results from failure of the pancreas to make a sufficient amount of insulin. Without insulin food cannot be used properly. Diabetes currently cannot be cured but can be controlled. Treatment consists of daily injections of insulin and a prescribed food plan. A student with diabetes can participate in all school activities and should not be considered different from other students.

Low blood sugar occurs when the amount of sugar in the blood is too low. This is caused by an imbalance of insulin, too much exercise, or too little food. Under these circumstances the body sends out numerous warning signs. If any of the following warning signs are recognized, the student should be encouraged to report them.

WARNING SIGNS OF LOW BLOOD SUGAR

Excessive Hunger	Blurred Vision	Poor Coordination
Perspiration	Irritability	Abdominal Pain or Nausea
Weak Pallor (pale skin)	Crying	Inappropriate Actions/ Responses
Headache	Confusion	
Dizziness	Inability to Concentrate	
Nervousness or Trembling	Drowsiness or Fatigue	

If the student is able to walk, please send him/her to the office accompanied by another student who can identify him/her to office personnel. If the student is unable to walk, please send for the nurse or an administrative assistant. The person who is sent for help should give the name of the student and the suspected problem.

Students with diabetes follow a prescribed diet and may select their foods from the school lunch menu or bring their own lunch. A midmorning and/or mid-afternoon snack may be necessary to help avoid low blood sugar.

The amount of sugar in the blood of a student with diabetes can be tested with special equipment. Testing the blood for sugar several times a day serves as an effective guide to proper diabetes control. Blood tests for sugar should be made before meals, and time should be allowed before lunch for the student who has diabetes to perform this test if requested.

The student with diabetes should be carefully observed in class, particularly before lunch. It is best not to schedule physical education just before lunch; and if possible, the student should not be assigned to a late lunch period. Many students require nourishment before strenuous exercise. Teachers and nurses should have sugar or carbohydrate available at all times. The student with diabetes should also carry a sugar or carbohydrate supply and be permitted to treat a reaction when it occurs.

Diabetic coma, a serious complication of the disease, results from uncontrolled diabetes. This does **NOT** come on suddenly and generally need not be a concern to school personnel.

Adapted from: “Diabetes Management in the School Setting”, 1998, Missouri Association of School Nurses.

National Association of School Nurses

Position Statement

Blood Sugar Monitoring in the School Setting

HISTORY:

Numerous students with diabetes attend school and require monitoring procedures to obtain/maintain optimal blood sugar levels. Blood glucose monitoring utilizes a drop of blood touched to a test strip and a meter that reads and displays a current level of blood glucose. Medical studies show that management of near normal glucose levels will prevent and slow the development of diabetes complications. The National Association of School Nurses (NASN) supports self-management of diabetes, while considering the individual status of each student.

DESCRIPTION OF ISSUE:

Each student with diabetes is unique in regard to his or her disease process, developmental and intellectual abilities, and required level of assistance with blood sugar monitoring. Academic productivity may be impaired if a student with diabetes is unable to monitor blood sugar levels promptly on an "as needed" basis in the least restrictive educational setting. NASN recognizes that the Occupational Safety and Health Administration (OSHA) regulations on bloodborne pathogens should apply to the school setting and all school personnel should adhere to local policies regarding these regulations.

RATIONALE:

Timely blood sugar monitoring and prompt intervention may prevent life threatening diabetic emergencies, in particular, hypoglycemic episodes. The school nurse is qualified to determine what level of assistance is required to competently perform, interpret, and intervene in blood sugar monitoring. Easy access to blood sugar monitoring at any given time is encouraged within the school setting.

CONCLUSION:

It is the position of the National Association of School Nurses that school nurses supervise the management and treatment of blood sugar monitoring within the school setting. The school nurse, parent, student, and health care provider should evaluate the self-management of blood sugar monitoring on a case-by-case basis. An individual health care plan including an emergency plan should be written by the school nurse and maintained for all students with diabetes. Training in recognizing symptoms of abnormal blood sugar levels should be provided to appropriate school staff. Direction may include assistance by staff with the blood sugar monitoring procedure, recording of results, and intervention as ordered by the student's health care provider.

School districts must establish direction in handling episodes of low blood sugar in students and staff members. State laws, nurse practice acts, and district policies may determine where the monitoring procedure will occur and may specify other staff members' ability to assist with the procedure. These determinations should be done on a case-by-case basis, taking into consideration student safety, proximity of the student's classroom to the health room, and the availability of the school nurse and other appropriately trained staff.

References/Resources:

1. American Diabetes Association (2001). Care of children with diabetes in the school and day care setting. *Diabetes Care*, 24(supplement 1) S108-112.
2. Gerber, M.V., Kalb, K.M., Luehr, R.E., Miller, W.R., Silkworth, C.K., & Will, S.I. (1993) *The school nurse's source book of individualized health care plans*. North Branch, MN: Sunrise River Press.
3. Grabeel, J. (1997) *Nursing Practice Management: Compendium of Individualized Healthcare Plans* Scarborough, ME: NASN
4. Hootman, J. (1996) *Quality nursing interventions in the school setting: Procedures, models, and guidelines*. Scarborough, ME: NASN
5. KinderCare Settlement Agreement Re: Diabetes Finger-Prick Tests (1996) www.usdoj.gov:80/crt/ada/kinder1.htm
6. Roche Diagnostics (1998) *Accu-Check Blood Glucose Monitor & Test Strips Users Manual* Indianapolis, IN
7. Individuals with Disability Education Act (IDEA) and Section 504 of the Rehabilitation Act of 1973 *School Bill of Rights for Children with Diabetes*

Adopted: June 2001

Treatment of Low Blood Sugars

1. A low blood sugar level is an **emergency that needs to be treated immediately**. Without treatment, a low blood sugar may progress to unconsciousness and convulsions.

2. Low blood sugars can be prevented by:
   - **Extra** snacks for extra activity (consult exercise guide and/or dietitian)
   - Eating immediately after taking insulin if the blood sugar is <100 mg/dl
   - Eating an **extra snack** of carbohydrate and protein if the blood sugar is <120 mg/dl at bedtime
   - Replacing carbohydrates in the meal plan with things like regular soda or regular popsicles **ON SICK DAYS**

3. Treatment should be given whenever the blood sugar drops below 90 mg/dl or symptoms are present.

4. Notify parent or guardian when treatment is necessary due to low blood sugar.

SYMPTOMS	TREATMENT
MILD Irritibility Shakiness Sweating Fast heart rate Pale skin Dizziness Hunger	**QUICK-ACTING SUGAR** • 15 grams of carbohydrate • **See treatment guide by age on page 97.** • **If not better in 15 minutes, repeat treatment.** • **If the next meal or snack is more than 30 minutes away, give an extra snack of carbohydrate and protein.**
MODERATE Confusion Poor coordination Behavior change Slurred speech Weakness Headache	**INSTANT GLUCOSE/CAKE FROSTING (GEL)** • Insert tube between gum and cheek. • Administer appropriate amount. • If no response in 15 minutes, administer glucagon. • If the next meal or snack is more than 30 minutes away, give an **extra snack** of carbohydrate and protein.
SEVERE Unconsciousness Seizures Inability to swallow	**GLUCAGON** • Administer Glucagon as directed. • **Call paramedics.** • **Phone diabetes doctor on call.** • **Feed as soon as possible after awakening.**

Adapted from: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses.

Carbohydrates for Treatment of Low Blood Sugar Management

- The following table contains correct amounts of carbohydrate for treating low blood sugar in children. Amounts will vary according to age.
- Chocolate candy bars should NOT be used in the treatment of low blood sugar because they are high in fat content. Fat causes digestion to be slower so that sugar does not enter the cells as fast as other choices.
- Low fat or 2% milk is a good choice (especially during the night if the next meal is more than about 30 minutes away) because it also contains protein and some fat which will help keep the blood sugar in target range.
- If the next meal or snack is more than 30 minutes away, the fast-acting sugar should be followed by an extra snack consisting of a bread and a meat.

ITEM	5 YEARS OF AGE AND YOUNGER (5-10 grams)	6-10 YEARS OF AGE (10-15 grams)	10 YEARS OF AGE AND OLDER (15-20 grams)
B-D Glucose Tablets (large) (3 tabs = 15 grams)	1-2 tablets	2-3 tablets	3-4 tablets
Dextrotabs, Dextrasol Tabs (small) (7 tabs = 15 grams)	3-4 tablets	5-6 tablets	7-8 tablets
Glucose Gel (31 gram tube)	1/6-1/3 tube	1/3-1/2 tube	1/2-2/3 tube
Cake icing (small tube) (1 teaspoon = 4 grams	2 teaspoons	3 teaspoons	4-5 teaspoons
Honey, maple or Karo Syrup (1 teaspoon = 5 grams)	1-2 teaspoons	2-3 teaspoons	3-4 teaspoons
Orange Juice (1/3 cup = 10 grams)	1/4 -1/2 cup	1/2 -3/4 cup	3/4-1 cup
Apple Juice (1/3 cup = 10 grams)	1/4 -1/2 cup	1/2 -3/4 cup	3/4 -1 cup
Table Sugar (1 teaspoon = 4 grams)	2 teaspoons	3 teaspoons	4-5 teaspoons
Regular Soda (1 ounce = 3 grams)	2-3 ounces	4-5 ounces	5-6 ounces
Raisins (1 tbsp = 7 ½ grams)	1 tablespoon	1 1/2 -2 tablespoons	2 1/2 -3 tablespoons
Lifesavers (1 = 3 grams)	2-3	4-5	5-7
Milk-2% (8 ounces = 12 grams)	4-5 ounces	6-7 ounces	8-10 ounces

DIABETES: LOW BLOOD SUGAR EMERGENCIES

MY NAME IS _____

I HAVE DIABETES AND MUST TAKE INSULIN DAILY.

IF YOU SEE ME:

HUNGRY, WEAK

CRYING, CONFUSED
IRRITABLE

PALE
PERSPIRING
SHAKY

DROWSY
INATTENTIVE

HEADACHE
NAUSEA

OR BEHAVING
STRANGELY
IN
ANY WAY...

I may be having a LOW BLOOD SUGAR EMERGENCY (insulin reaction).
My most common symptoms are _____

_____

A LOW BLOOD SUGAR EMERGENCY (insulin reaction) would most likely occur before lunch or after strenuous exercise or _____

_____

IF THIS HAPPENS PLEASE GIVE ME SOME FORM OF SUGAR, SUCH AS:

- SOFT DRINK (non-diet)
- CANDY OR HONEY
- SUGAR (at least 2 packets)
- FRUIT JUICE

Repeat if I do not improve in 5–10 minutes!

Don't leave me alone, please.

Follow up with additional food — such as milk, cookies, crackers.

I may need coaxing to eat.

But if I'm unconscious or unable to swallow, don't force drinking or eating — GET EMERGENCY HELP!

For additional help call:

PARENT _____ PHONE _____

PARENT _____ PHONE _____

DOCTOR _____ PHONE _____

Please don't send me home alone when I've had a reaction.

(See reverse side)

Facts About Diabetes

1. A person who has Type 1 diabetes has to take insulin by injection at least once a day because he or she does not make enough of the hormone insulin to meet the body's needs. Without insulin, one's food cannot be properly metabolized.

2. Sometimes the balance between sugar and insulin in the body is upset. Then the person can have a LOW BLOOD SUGAR EMERGENCY (insulin reaction) This can occur at any time, but most frequently happens after:

   - Excessive physical activity, without extra food ahead of time
   - Failure to eat the proper amount at the proper time
   - Too much administered insulin

3. The symptoms of LOW BLOOD SUGAR EMERGENCY (insulin reaction) vary. Most young people with diabetes are aware when they need extra food. But there may be times when they may not be aware that a low blood sugar emergency is occurring. At that point you must be able to recognize the symptoms and offer the foods mentioned on the reverse side of this card.

4. On occasion, the youngster with diabetes may need to drink more water than usual and have to go to the bathroom more often than normally allowed. This is the result of high blood sugar, and you may want to alert the parents.

For additional copies and information:

Juvenile Diabetes Research Foundation International
Metro Saint Louis/Greater Missouri Chapter
225 S Meramec, Suite 400
St. Louis, Mo 63105
Ph: (314) 726-6778
www.jdrf.org

The Juvenile Diabetes Foundation International was founded in 1970 by parents of children with diabetes who were convinced that diabetes could be cured through research. They were and still are determined to make that cure happen in their children's lifetime.

JDF is the world's leading nonprofit, nongovernmental funder of diabetes research. JDF's mission is to find a cure for diabetes and its complications through the support of research. For more information, visit our website: www.jdf.org.

(See reverse side)

Novo Nordisk DIABETES Care

HYPOGLYCEMIA
(Low Blood Glucose)

Causes: Too little food, too much insulin or diabetes medicine, or extra activity.

Onset: Sudden, may progress to insulin shock.

SYMPTOMS

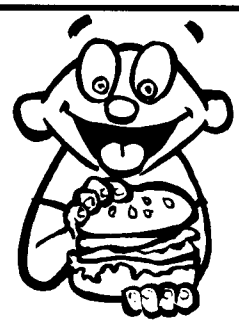

SHAKING

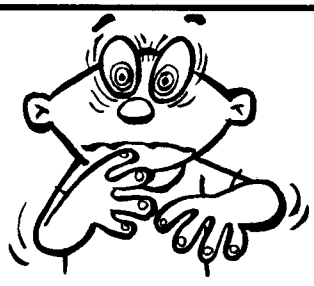

FAST HEARTBEAT


SWEATING


DIZZINESS


ANXIOUS


HUNGER

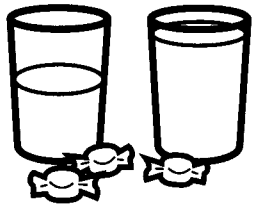

IMPAIRED VISION

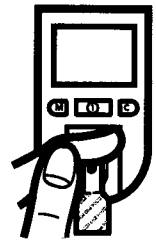

WEAKNESS FATIGUE

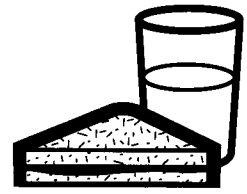

HEADACHE


IRRITABLE

WHAT CAN YOU DO?


Drink 1/2 glass of juice or regular soft drink, or 1 glass of milk, or eat some soft candies (not chocolate).


Within 20 minutes after treatment TEST BLOOD GLUCOSE. If symptoms don't stop, call your doctor


Then, eat a light snack (1/2 peanut butter or meat sandwich and 1/2 glass of milk).

Treatment may vary with different medications.

Concept developed by Rhoda Rogers, RN, BSN, CDE, Sunrise Community Health Center, Greeley, Colorado

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Novo Nordisk DIABETES Care

HIPOGLICEMIA

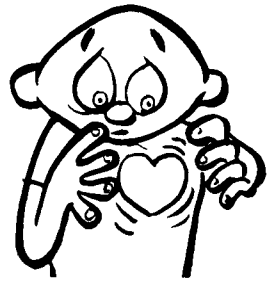
(Bajo Nivel de Glucosa en la Sangre)

CAUSAS: Muy poca comida, demasiada insulina o medicina oral de diabetes, o mucho ejercicio

COMIENZA DE REPENTE: Puede progresar a reacción de insulina

SÍNTOMAS

TEMBLOR

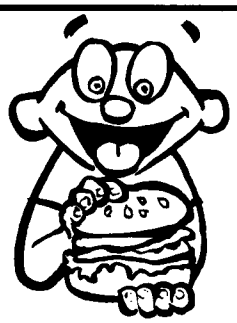


PULSO ACELERADO

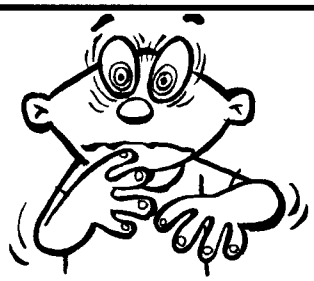
SUDOR

MAREO

ANSIEDAD



HAMBRE



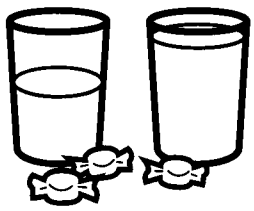
VISION BORROSA

DEBILIDAD CANSANCIO

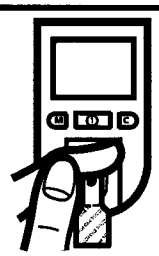
DOLOR DE CABEZA

IRRITABILIDAD

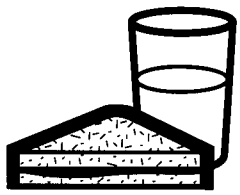
¿QUE PUEDE HACER?



Si usted tiene estos síntomas, beba 1/2 taza de jugo o una taza de leche, o coma varias cucharaditas de azúcar.



Dentro de 20 minutos, PRUEBE EL AZUCAR EN LA SANGRE. Si los síntomas no han parado, llame al médico.



Si los síntomas han parado, ingiera una comida pequeña. Pruebe el azúcar en la sangre otra vez.

El tratamient podría variar usando diferentes medicamentos.

Novo Nordisk DIABETES Care

HYPERGLYCEMIA
(High Blood Glucose)

Causes: Too much food, too little insulin or diabetes medicine, illness or stress.

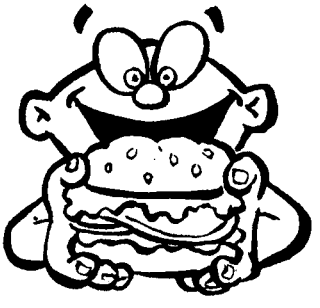
Onset: Gradual, may progress to diabetic coma.

SYMPTOMS

EXTREME THIRST

FREQUENT URINATION

DRY SKIN



HUNGER

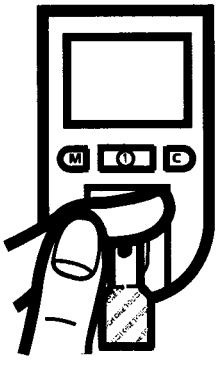
BLURRED VISION

DROWSINESS

DECREASED HEALING

WHAT CAN YOU DO?

TEST BLOOD GLUCOSE



If over 200 mg/dL for several tests or for 2 days

CALL YOUR DOCTOR

Concept developed by Rhoda Rogers, RN, BSN, CDE, Sunrise Community Health Center, Greeley, Colorado

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Novo Nordisk DIABETES Care

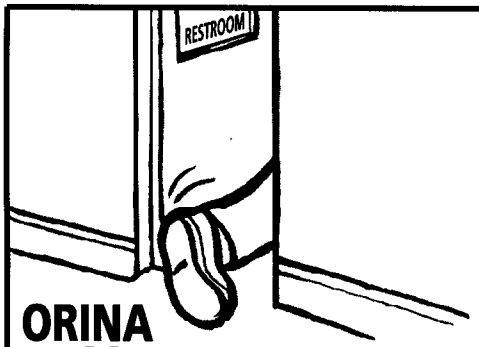
HIPERGLICEMIA
(Exceso de Glucosa en la Sangre)

CAUSAS: Mucha comida, muy poca insulina, enfermedad o nervios.

COMIENZA GRADUAL: Puede progresar a un coma diabético.

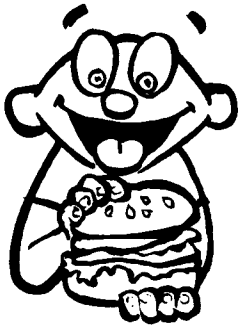
SÍNTOMAS

DEMASIADA SED



ORINA CON FRECUENCIA

PIEL SECA



HAMBRE

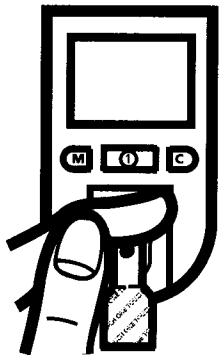
VISION BORROSA

SUEÑO

LAS HERIDAS NO SE SANAN

¿QUE PUEDE HACER?

PRUEBE EL AZÚCAR EN LA SANGRE



Si mas de 200 mg/dL para varias pruebas o por 2 dias

LLAME AL MÉDICO

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What is Glucagon?

Glucagon is used to raise the blood sugar when a child is unable to take liquid or food by mouth because of severe sleepiness, unconsciousness, or seizure activity. Glucagon must be injected with a syringe into the skin, like insulin. It is a hormone, which helps the liver to release sugar to raise the blood sugar.

When Do You Use Glucagon?
When the child has low blood sugar (usually below 20mg/dl) and is unable to take liquid or food by mouth because of severe sleepiness, unconsciousness, or seizure activity.

What You Need

- 2 Glucagon Emergency Kits. You will need a prescription to purchase the kits at a pharmacy. It is recommended you have one for home and one for school.
- Use of glucagon should be part of a child's Individualized Health Plan and be supplied to the school by the family with accompanying physician order.

When Possible, Check Blood Sugar Before and/or After Giving Glucagon.
To Inject Glucagon:

- Glucagon is now available as recombinant DNA in a kit containing the glucagon powder in a vial and the diluent in a glucagon syringe.
- Remove the seal from the bottle of glucagon in the kit (the small vial/bottle containing a white powder/pellet).
- Inject the liquid in the syringe into the bottle of glucagon.
- Remove syringe from the bottle of glucagon, shake the bottle gently until the glucagon dissolves (looks clear).
- Draw-up the solution in the bottle with the correct size syringe based on the weight of the child.
- The glucagon syringe is marked with only 2 dosages 0.5 mg and 1.0 mg. The recommended dose of glucagon to inject is*:
  - –0.5 mg for a child 50 pounds or under
  - 1.0 mg for a child over 50 pounds
- Inject glucagon in the same manner as insulin injections.
- Keep the child lying on their side in case of vomiting.
- If the child does not respond, call 911.
- Once the child is awake give a snack such as cheese and crackers.

NOTE*:* It is common for the child to vomit or feel nauseous after receiving glucagon. Keep glucagon at room temperature in a central location in the home. Inform other caregivers of the location.

When possible, practice drawing up glucagon with an expired kit. Check the date of glucagon kits on a regular basis. Discard if past the expiration date. Obtain a refill immediately.

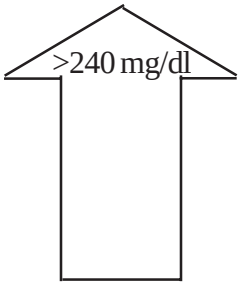
** dosage recommendations from glucagon manufacturer*

Adapted from: "Children with Diabetes: A Resource Guide for Schools", 2001, New York State Department of Health

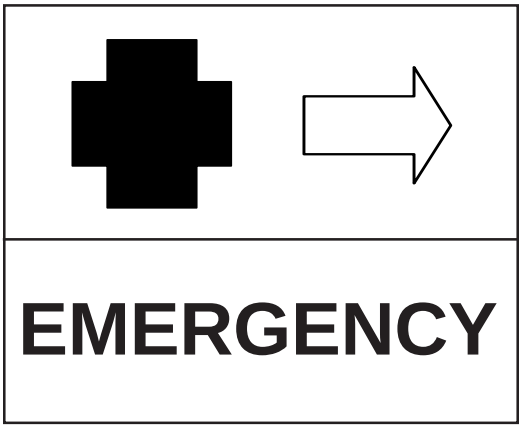
Treatment of High Blood Sugars

These are only recommendations. Follow orders as prescribed by the student's physician.

1. If the blood sugar level is >240 mg/dl, check urine ketones regardless of how the child feels.



2. If **URINE KETONES** are negative to small:
   * Have the child drink 8-12 ounces/hour of caffeine-free, sugar-free, noncaloric fluids such as water, diet soda
   * Recheck blood glucose and urine for ketones in 2-3 hours
   * Repeat above as needed



3. If **URINE KETONES** are moderate to large, call for help immediately
   * This may mean the child needs extra insulin **NOW**
   * **Call parent or guardian immediately.**
   * **If parent or guardian cannot be reached and student is vomiting and unable to take fluids by mouth, call emergency personnel for transport to the emergency room.**

NOTE: The school health nurse or personnel should review the Emergency Action Plan to determine what the school and parent(s)/guardian(s) had agreed upon as the first step when dealing with the situation once ketones have been detected. If the Emergency Action Plan identifies the child is to be given insulin immediately, then do so; otherwise, follow the steps on the Emergency Action Plan.

Symptoms of high blood sugar may include:

- Lack of appetite
- Blurred vision
- Difficulty in breathing
- Fruity odor of breath or urine
- Dry mouth
- Mental sluggishness, slowness to respond
- Nausea, vomiting, stomach pain
- Dry or flushed skin
- Weakness
- Intense thirst
- Frequent urination

Adapted from: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses, "Diabetes in Children A Resource Guide for School Personnel", 2002, Illinois Department of Human Services, http://www.iasn.org/diabets.pdf.

(Sample #1)

Emergency Action Plan
Diabetes Healthcare

Student's Name _____ _____ Grade _____

Address _____ Home Phone _____

Father/Guardian _____

Phone: Home_____ Work_____ Cell_____

Mother/Guardian _____

Phone: Home_____ Work_____ Cell_____

Other person to contact in an Emergency:
Name _____

Address _____

Phone: Home_____ Work_____ Cell_____

Hospital Preferred _____

Physician(s) or Health Care Provider's Name _____

Phone _____

Emergency items to be left at school:

Glucose tablets _____ Glucagon _____
Snacks _____ Blood glucose meter _____
Glucose Gel _____ Insulin _____
_____ Syringes _____
_____ Other _____

In the event of a low blood sugar response, the procedure routinely followed at school is: to give some form of sugar or carbohydrate, such as ½ carton of milk, ½ cup fruit juice, or ½ cup non diet soda, followed by crackers with cheese. If the student is unconscious, call 911.

I approve the above emergency healthcare action plan as written Yes ____ No____

Please make the following changes to the emergency healthcare action plan:
_____
_____
_____
_____

- (continued on back) -

(Sample #1 Continued)

Emergency Action Plan Diabetes Healthcare

List other additional information or significant special health concerns of this student.

_____
_____
_____
_____
_____
_____

I give permission for emergency blood glucose testing by the school nurse or designee using equipment I have provided. I understand that when the school nurse or designee is not available for emergency blood glucose testing, the parent/guardian will be notified or "911" will be called. Yes _____ No _____

_____

Additional directions regarding blood glucose testing: _____

_____
_____
_____

Written and submitted by: _____ _____
Nurse or Designee Date

Reviewed and signed: _____ _____
Parent/guardian Date

_____ _____
Student Date

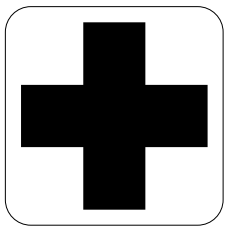
_____ _____
Physican or Health Care Provider Date

To be reviewed _____
Date

The emergency healthcare action plan should be revised according to the child's specific needs, at least annually.

Source: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses. Sample of Springfield School District Emergency Action Plan – Diabetes Healthcare.

(Sample #2)



Health Services Department Emergency Plan DIABETES

In an emergency:

1) Stay with child.
2) Call / ask someone to call school _____ who will assess child and summon EMS if needed.

IF YOU SEE THIS:	**DO THIS:**
(Based on this child's current condition, a Medical Emergency for this child is:)	
IF student is not responsive (unconscious, having seizures, or is unable to swallow)	• **CALL 911**…Call Parents/Guardians • Don't attempt to give anything by mouth. • Position on side, if possible. • Contact school nurse or trained diabetes personnel. • Administer glucagon, as prescribed. • Stay with student.
IF student is non-responsive, but able to swallow	• Squirt _____ inside cheek closest to ground. • _____ is kept in _____. • Measure Blood Sugar with monitor (to be done by _____).
IF student is responsive	• Hypoglycemic (low blood sugar) reaction: IF Blood Sugar reading is _____ or below, then give _____. • Hyperglycemia (high blood sugar) reaction: Keep student walking or sitting and drinking water. • If Blood Sugar is >_____ mg/dl, student, school nurse or assigned person (identify:_____) should check urine for ketones.

IMPORTANT EMERGENCY NUMBERS:

_____ _____

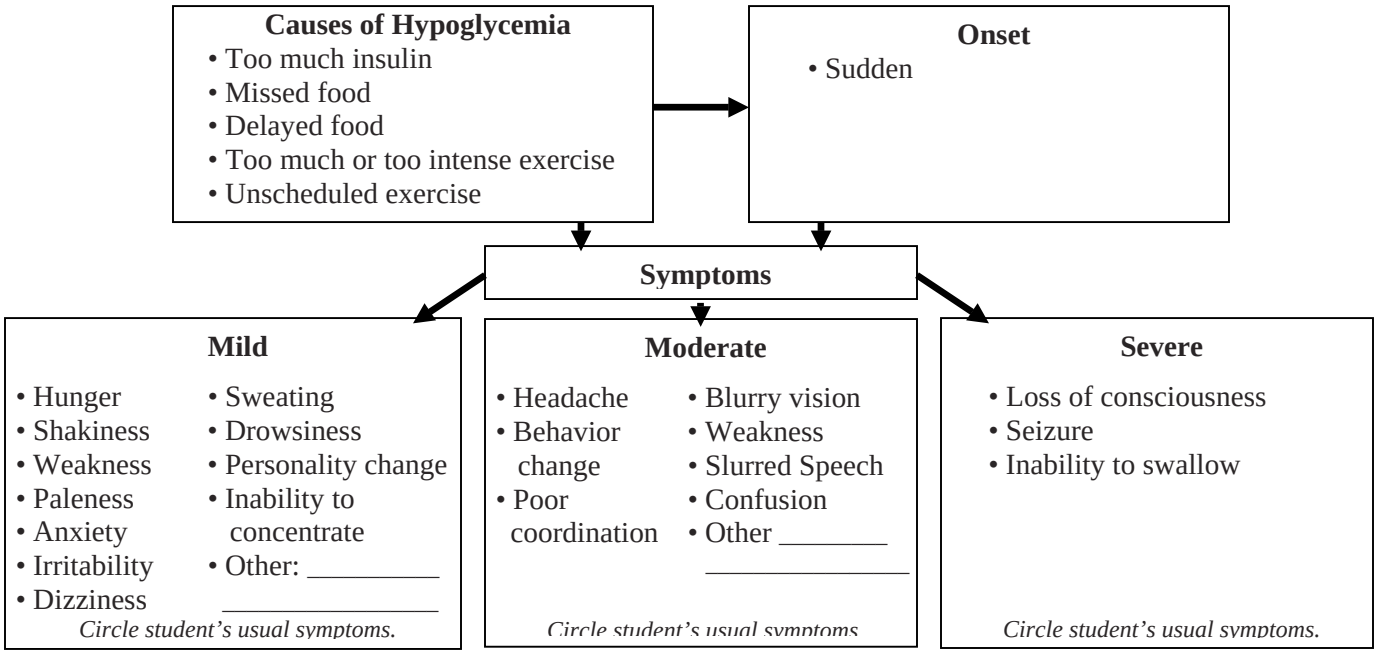
_____ _____

_____ _____

Adapted from: "Diabetes Management in the School Setting", 1998, Missouri Association of School Nurses. Sample from Lee's Summit School District.

Hypoglycemia (Low Blood Sugar)
Quick Reference Emergency Planning Tool

Never send a child with suspected low blood sugar anywhere alone.



Actions Needed

Notify School Nurse or Trained Diabetes Personnel. If possible, check blood sugar per student's Individualized Health Plan. When in doubt, always TREAT FOR HYPOGLYCEMIA. If treatment is necessary, notify parent/guardian.

Mild

- Student may/may not treat self.
- Provide quick-sugar source.
  3-4 glucose tablets
  or
  4 oz. juice
  or
  6 oz. regular soda
  or
  3 teaspoons of glucose gel
- Wait 10 to 15 minutes.
- Recheck blood glucose.
- Repeat food if symptoms persist or blood glucose is less than _____.
- Follow with a snack of carbohydrate and protein (e.g., cheese and crackers).

Moderate

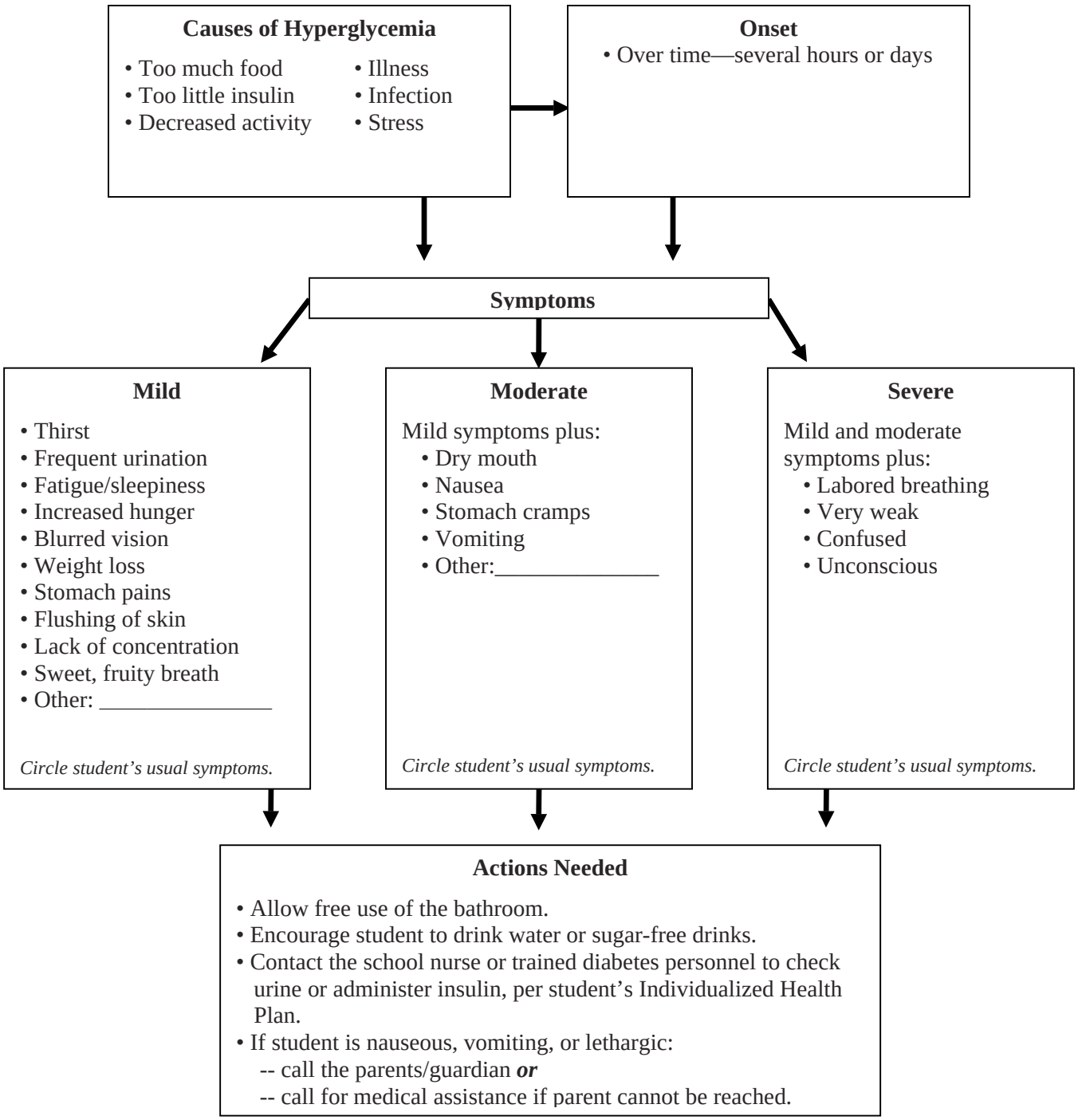
- Someone assists.
- Give student quick-sugar source per MILD guidelines.
- Wait 10 to 15 minutes.
- Recheck blood glucose.
- Repeat food if symptoms persist or blood glucose is less than ___.
- Follow with a snack of carbohydrate and protein (e.g., cheese and crackers).

Severe

- Don't attempt to give anything by mouth.
- Position on side, if possible.
- Contact school nurse or trained diabetes personnel.
- Administer glucagon, as prescribed.
- Call 911.
- Contact parents/guardian.
- Stay with student.

Adapted from: *Helping the Student with Diabetes Succeed: A Guide for School Personnel*, June 2003, Page 53. National Diabetes Education Program. http://www.ndep.nih.gov/diabetes/pubs/Youth_SchoolGuide.pdf

Hyperglycemia (High Blood Sugar)
Quick Reference Emergency Planning Tool



Adapted from: *Helping the Student with Diabetes Succeed: A Guide for School Personnel*, June 2003, Page 54. National Diabetes Education Program. http://www.ndep.nih.gov/diabetes/pubs/Youth_SchoolGuide.pdf

Local and National Resources

The American Diabetes Association (ADA) is the leading nonprofit health organization providing diabetes research, information, and advocacy. Their resources include:

Wizdom Kit for children who are newly diagnosed with diabetes
http://www.diabetes.org/wizdom/index.shtml

"Diabetes Care Tasks at School: What Key Personnel Need to Know" Curriculum
http://www.diabetes.org/schooltraining/

Education Recognition Programs
http://www.diabetes.org/education/eduprogram.asp

Resource Guide
http://www.diabetes.org/uedocuments/monitors-tables.pdf

For general information about diabetes, or to locate the office nearest you, call 1-888-DIABETES (342-2383) or visit their website at: http://www.diabetes.org.

ADA – Springfield Area
1944-A E Sunshine
Springfield, MO 65804
(417) 890-8400

ADA – Joplin
P.O. Box 4995
Joplin, MO 64802
(417) 624-8455

ADA – Mid-Missouri
PO Box 1013
Columbia, MO 65205-1013
(573) 443-8611

ADA – Kansas City Area
10580 Barkley, Ste 400
Overland Park, KS 66202
(913) 383-8210

ADA – St Louis Area
10820 Sunset Office Dr, Ste 220
St Louis, MO 63127
(314) 822-5490

Newly diagnosed families can turn to the Juvenile Diabetes Research Foundation (JDRF) for valuable information on how to deal with their child's illness. JDRF offers a "Bag of Hope" for parents with children who are newly diagnosed with diabetes. For more information contact the office nearest you or visit their website at: http://www.jdrf.org

JDRF – Metro St Louis/Greater Missouri Chapter
225 S Meramec, Suite 400
St Louis, MO 63105
(314) 726-6778

JDRF – Kansas City Chapter
6701 West 64th Street, Suite 319
Shawnee Mission, KS 66202
(913) 831-7997

Diabetes Educators provide valuable services to those who have diabetes. To locate a Certified Diabetes Educator within your area, go to the American Association of Diabetes Educators web site at: http://www.aadenet.org/FindAnEduc/index.html.

Central Missouri Association of Diabetes Educators
(573) 632-5310

Kansas City Regional Association of Diabetes Educators
(913) 631-3840 or
(913) 676-2495

St Louis Association of Diabetes Educators
(314) 644-6575

The Starbright Foundation is dedicated to the creation and distribution of programs that empower seriously ill children and teens to address the challenges that accompany prolonged illness.
http://www.starbright.org/

Children With Diabetes
http://www.childrenwithdiabetes.com/index_cwd.htm

Nutrition is a key in managing diabetes. To locate a registered dietitian near you, use the American Dietetic Association's web-tool "*Find a Nutrition Professional*" at http://www.eatright.org/Public/index_7684.cfm

or contact:

Missouri Dietetic Association
PO Box 1225
101 E. High St, Ste 200
Jefferson City, MO 65102-1225
(573) 636-2822
http://www.eatrightmissouri.org

The American Dietetic Association also has various diabetes related materials for health professionals and consumers http://www.eatright.org/Public/

The Missouri Department of Health and Senior Services, Diabetes Prevention and Control Program has a web page that provides information on diabetes and links to numerous diabetes related web sites http://www.dhss.state.mo.us/diabetes

The Missouiri Department of Health and Senior Services, Division of Community Health has a nutrition website that has program materials, recipes, and tips you can directly download http://www.dhss.state.mo.us/MissouriNutrition/

For more information on community health centers that provide sliding-scale fee services, contact:

Missouri Primary Care Association
3325 Emerald Lane
Jefferson City, MO 65109
(573) 636-4222
http://www.mo-pca.org

National Center for Chronic Disease Prevention and Health Promotion, Division of Adolescent and School Health (DASH), offers a good overview of adolescent health issues and major health risk behaviors
http://www.cdc.gov/nccdphp/dash

National Center for Chronic Disease Prevention and Health Promotion, Diabetes Public Health Resource
http://www.cdc.gov/diabetes/index.htm

National Center for Education in Maternal and Child Health, Maternal and Child Health Library has a knowledge path about diabetes in children and adolescents
http://www.mchlibrary.info/KnowledgePaths/kp_diabetes.html

The National Institute of Diabetes and Digestive and Kidney Diseases has guidelines on obesity and nutrition
http://www.niddk.nih.gov/health/nutrition.htm

National Diabetes Education Program (NDEP)

"Helping the Student with Diabetes Succeed: A Guide for School Personnel" School Guide
http://ndep.nih.gov/materials/pubs/schoolguide.pdf

School Personnel Resource Web Page:
http://ndep.nih.gov/resources/school.htm

Carbohydrate Counts and Exchange Values for Fast-Foods
http://diabetes.about.com/cs/nutritiondiet/a/fast_food_guide.htm

"Carbohydrate Counting: As Easy as 1-2-3" Joslin Diabetes Center, Harvard University
http://www.joslin.harvard.edu/education/library/wcarbsug.shtml

Bilingual information on diabetes and nutrition
http://www.multiculturalhealth.org/

Children's Hospitals & Facilities

Ronald McDonald House Charities
of Mid-Missouri
1001 E Stadium Blvd
Columbia, MO 65201
(573) 443-7666
http://www.rmhc.missouri.org

Ronald McDonald House
3450 Park Avenue
St Louis, MO 63104
(314) 773-1100
http://www.rmhcstl.com/

Ronald McDonald House
4381 W Pine Blvd
St Louis, MO 63108
(314) 531-6601
http://www.rmhcstl.com/

Ronald McDonald House
2501 Cherry Street
Kansas City, MO 64108
(816) 842-8321
http://www.rmhckc.org/

Ronald McDonald House
1901 Olathe Blvd
Kansas City, KS 66103
(913) 384-5324
http://www.rmhckc.org/

Ronald McDonald House Family Room
2401 Gillham Rd
Kansas City, MO 64108
(816) 234-1533
http://www.rmhckc.org/

Ronald McDonald House
949 E Primrose Street
Springfield, MO 65807
(417) 886-0225

Ronald McDonald House
34th & Jackson
Joplin, MO 64803
(417) 624-2273
http://www.rmhjoplin.org/mission.htm

Ronald McDonald House
1001 East Stadium Blvd
Columbia, MO 65201
(573) 443-7666
http://www.rmhccolumbia.org/

St Louis Shriners Hospital
2001 S Lindbergh Blvd
St Louis, MO 63131-3597
(314) 432-3600
http://www.shrinershq.org/shc/stlouis/index.html

Children's Hospital
University of Missouri Health Care
One Hospital Drive
Columbia, MO 65212
(573) 882-4141
http://www.hsc.missouri.edu/~children/

St Louis Children's Hospital
One Children's Place
St Louis, MO 63110
(314) 454-6000
http://www.stlouischildrens.org/

SSM Cardinal Glennon Children's Hospital
1465 S Grand Blvd
St Louis, MO 63104
(314) 577-5600
http://www.cardinalglennon.com/internet/home/net10hom.nsf

Children's Mercy Hospital
2401 Gillham Road
Kansas City, MO 64108
(816) 234-3000
http://www.childrens-mercy.org/

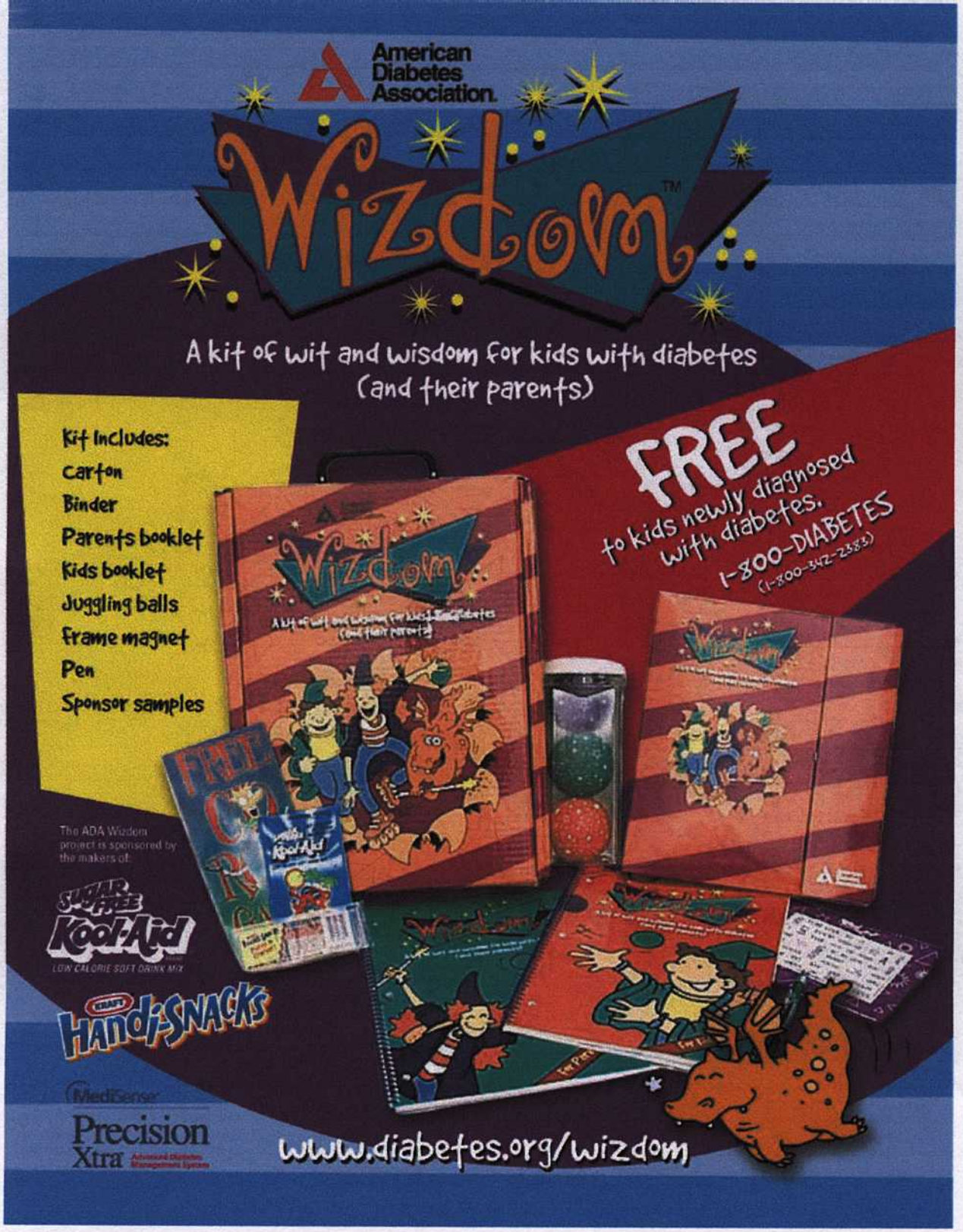
Children's Mercy South
5808 W 110th Street
Overland Park, KS 66211
(913) 696-8000
http://www.childrens-mercy.org/

Children's Mercy South
Children's Mercy Occupational Therapy and Physical Therapy, Speech and Hearing and Cardiology Clinics
5520 College Boulevard Building
Overland Park, KS 66211
(913) 696-8000
http://www.childrens-mercy.org/

Children's Mercy – Parallel Parkway
4517 Troup
Kansas City, KS 66102
(913) 287-8800
http://www.childrens-mercy.org/

Children's Mercy
Penn Park Medical Building
2928 Main
Kansas City, MO 64108
Pediatric Care Center
(816) 234-3086
Adolescent Medicine Clinic
(816) 234-3050
http://www.childrens-mercy.org/

Children's Mercy – Paseo Clinic
4601 Paseo, Ste 200
Kansas City, MO 64100
(816) 234-3050
http://www.childrens-mercy.org/


American Diabetes Association.
Wizdom™
A kit of wit and wisdom for kids with diabetes (and their parents)
Kit includes:
Carton
Binder
Parents booklet
Kids booklet
Juggling balls
Frame magnet
Pen
Sponsor samples
FREE
to kids newly diagnosed with diabetes.
1-800-DIABETES
(1-800-342-2383)
The ADA Wizdom project is sponsored by the makers of:
SUGAR FREE Kool-Aid
LOW CALORIE SOFT DRINK MIX
Handi-Snacks
MediSense
Precision Xtra
www.diabetes.org/wizdom

Metro Saint Louis /
Greater Missouri Chapter
225 S. Meramec Avenue, Suite 400
Saint Louis, MO 63105
t: 314-726-6778 f: 314-726-1659
www.jdrf.org

dedicated to finding a cure

Missouri's families

From: The staff and volunteers of JDRF

Bag of Hope, Teen Pack, and Family Network Programs

First, JDRF applauds school nurses for their help. We are pleased to introduce the Juvenile Diabetes Research Foundation. Since 1970 JDRF has given over $410 million to diabetes research and education about research. Research is the future for these families.

JDRF also offers immediate help to families through their free Bag of Hope, Teen Pack and Family Network Programs. The materials in these packages are given to each new family we meet. They have both educational and management tools to use during the life style changes they are experiencing. We ask you to give our contact information to families you meet so the families can receive these services. Thank you.

Other families who've experienced diabetes in their lives have created the materials for these programs. The bear in the Bag of Hope was created by a mom for her tiny child as a way of explaining the disease. By asking a child to care for his/her Rufus; it is easier for him/her to understand diabetes.

Two moms, both from Missouri, who recognized the empty hole in their initial training about how to help their child and how to easily explain the lows and highs to babysitters, teachers, and grandparents created the "You Are Not Alone" notebook. A mom from St. Louis wrote the children's books. This is how she learned to cope with the changes in her son's life. She found strength in helping others.

Teens receiving the Teen Pack find their newly designed backpacks "cool" Everyone appreciates the carb counting cards and cookbook.. It only takes a few minutes to realize how much can be learned from other's experiences.

The things in the Bag of Hope and the Teen Pack are from our hearts. Anytime a family needs JDRF services they can contact us. We find a mentoring family in their area. We also have support group meetings and events for families to get together and lean on each other.

Bayer Corporation, TheraSense, United Way of Greater St. Louis, Old Newsboy's and Boeing Corporation have financed the Bags of Hope and the Teen Packs. They willingly give toward this community education so the other funds JDRF raises can go directly into research for a cure.

For more information, to volunteer, or to receive a Bag of Hope or Teen Pack call our office.

Famous People With Diabetes

The following people deal with diabetes just like you do:

Art Shell – Eight-time All-Pro offensive tackle for the Oakland Raiders and later was the coach

Wilfred Bremley – Actor who has appeared in numerous TV and feature film movies including Cocoon, The China Syndrome and The Firm

SMASH – Radio broadcaster and musician (Saint Louis, MO)

Kenny Duckett – Football player who set a TD school record in his junior year at Wake Forest and went on to play in the NFL

Chris Dudley – NBA athlete who in 1999 grabbed his 5000th career rebound

Curt Fraser – Professional hockey player with the NHL and later went to coach

Steve Redgrave – Britain's greatest Olympian who won his fifth consecutive rowing gold medal at the Sydney Olympics in 2000

Jerry Mathers – Actor who portrayed 'Beaver' Cleaver on the classic TV series Leave It To Beaver

Patti LaBelle – Started in a girl-group in the '60s, powered through rock and soul in the '70s with dance diva group LaBelle, and has gone onto solo superstardom

Bret Michaels – Lead singer and founding member of '80s hair band, Poison, who had multiple platinum-selling albums

B.B. King – Unarguably considered the King of the Blues and a legend in his own time

Nicole Johnson – Miss America 1999

Gary Hall, Jr. – Olympic gold medallist swimmer

Kelli Keuhne – Amateur golfer who has won several championships

Charles Quincy Troope – Currently serving his 11th term in the Missouri House of Representatives

Jay Leeuwenburg – Native Saint Louisian (Kirkwood High School Graduate) who has played 11 seasons in the NFL as an offensive lineman

Bobby Clarke – Hockey star with the NHL's Philadelphia Flyers, he won three MVP trophies

Del Ennis – Three-time All-Star outfielder

Jonathon Hayes – Considered one of the best blocking tight ends in his day, this Kansas City Chief played 12 seasons in the NFL

Halle Berry – Emmy-award winning actress and feature film star who became the first African-American actress to win the Best Actress Oscar for 2001's Monster's Ball

Johnny Cash – Country music legend that had more than 100 top 40 country hits plus a dozen pop hits

Andrew Lloyd Webber – One of the most successful composers ever, he wrote numerous musicals including Evita and Cats, the longest running musical ever

Mick Fleetwood – Drummer and founding member of '70s rock band, Fleetwood Mac

Pump Girls – Pop band made up of girls who wear insulin pumps, their goal is to help motivate teens to deal with their diabetes

Luther Vandross – Singer and master of '80s soul music

Delta Burke – Two-time Emmy-nominated actress for her work on the popular sitcom Designing Women

Arthur Ashe – One of the most prominent tennis players of his time and the first African-American to be ranked #1 in the world

Billy Jean King – Tennis great who in 1973 defeated Bobby Riggs in a 'Battle of the Sexes' match holding the record for most people attending a single tennis match at 30,427 and a TV audience of 90 million

Fred Buttrell – F-15 Eagle fighter pilot who flew sorties in Operation Desert Storm in the United States Air Force

Mary Tyler Moore – Star of the Mary Tyler Moore Show and numerous movies, she is currently the international chairman of the Juvenile Diabetes Research Foundation

Dr. Alan Permutt – Professor of Medicine and Professor of Cell Biology and Physiology at Washington Unversity School of Medicine

Types of Insulin

Product	Manufacturer	Form	Strength
Rapid Acting (onset less than 15 minutes)			
Humalog (insulin lispro)	Lilly	Human	U-100
Humalog Cartridges (1.5 ml and 3 ml)	Lilly	Human	U-100
NovoLog (insulin aspart)	Novo Nordisk	Human	U-100
Humalog Prefilled Pen (3 ml, packets of 5)	Lilly	Human	U-100
NovoLog PenFill (insulin aspart) (3 ml)	Novo Nordisk	Human	U-100
NovoLog Mix 70/30*	Novo Nordisk	Human	U-100
NovoLog Mix 70/30 Flex Pen* (3 ml)	Novo Nordisk	Human	U-100
Short Acting (onset ½-2 hours)			
Humulin R (regular)	Lilly	Human	U-100, U-500
Iletin II (regular)	Lilly	Pork	U-100
Novolin R (regular)	Novo Nordisk	Human	U-100
Novolin R PenFill (3 ml)	Novo Nordisk	Human	U-100
ReliOn/Novolin R (regular)	Wal-Mart Pharmaceuticals/ Novo Nordisk	Human	U-100
Intermediate Acting (onset 2-4 hours)			
Humulin L (lente)	Lilly	Human	U-100
Humulin N (NPH)	Lilly	Human	U-100
Iletin II NPH	Lilly	Pork	U-100
Novolin L (lente)	Novo Nordisk	Human	U-100
Novolin N (NPH)	Novo Nordisk	Human	U-100
Novolin N PenFill (3 ml)	Novo Nordisk	Human	U-100
Long Acting (25 hours)			
Humulin U (ultralente) (onset 4-6 hours) (24 hours/once per day)	Lilly	Human	U-100
Lantus (insulin glargine) (onset 1.1 hours) (24 hours/once per day)	Aventis Pharmaceuticals	Human	U-100
Mixtures			
Humulin 50/50 (50% NPH, 50% regular)	Lilly	Human	U-100
Humalog Mix 75/25 (75% insulin lispro protamine suspension and 25% insulin lispro rDNA origin)	Lilly	Human	U-100
Novolin 70/30 (70% NPH, 30% regular)	Novo Nordisk	Human	U-100
Novolin 70/30 PenFill (70% NPH, 30% regular; 3 ml)	Novo Nordisk	Human	U-100

*Novolog Mix 70/30 is 70% insulin aspart protamine suspension and 30% insulin aspart injection.

Insulin Pump Resources

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Tappon D, Parker M. Baily W. *Easy as ABC, What you Need to Know About Children Using Insulin Pumps in School.* Disetronic Medical Systems, Inc. 1-800-280-7801.

Walsh J, Roberts R. *Pumping Insulin: Everything You Need for Success with an Insulin Pump*. 3rd ed. San Diego, CA: Torrey Pines Press, 2000.

Your School and Your Rights: Protecting Children with Diabetes Against Discrimination in Schools and Day Care Centers. Alexandria, VA: American Diabetes Association, 2000 (Brochure); available online at www.diabetes.org/ada/scrights.asp

Zitnay C. Exercise and pump use. *Today's Educator*. 2:1, 4-5, 2000.

www.cdc.ca.gov/spbranch/sed/healthup/diabtcre.htm Healthcare Needs of Students with Diabetes in School, a learning module titled, *Pediatric Education for Diabetes in Schools*. This is a copyrighted-program, written by Mary Zombeck, school nurse, Orange County Department of Education. Includes forms, charts, treatment record sheets.

www.childadvocate.net/pump/htm (Insulin Pump Therapy; sample agreement)

www.childrenwithdiabetes.com (Diabetes at school; The laws, schools, and your child with diabetes.)

www.diabetes.org/ada/scrights.asp (Your school and your rights.)

www.insulin-pumpers.org/pkids/letter01.html (About diabetes for the teachers and coaches of [child's name]). Edited and used with permission.

Source: Barbara B Bradley, MS, BSN, RN, CDE, Manager of Clinical Services, Anamis Corporation, Frazer, PA, 1-610-644-8990.

Glossary

Albumin - A protein found in blood plasma and urine. The presence of albumin in the urine can be a sign of kidney disease.

Autoimmune process - A process where the body's immune system attacks and destroys body tissue that it mistakes for foreign matter.

Beta cells - Cells that make insulin. Beta cells are found in areas of the pancreas called the islets of Langerhans.

Bladder - A hollow organ that urine drains into from the kidneys. From the bladder, urine leaves the body.

Blood glucose - The main sugar that the body makes from the food we eat. Glucose is carried through the bloodstream to provide energy to all of the body's living cells. The cells cannot use glucose without the help of insulin.

Blood pressure - The force of the blood against the artery walls. Two levels of blood pressure are measured: the highest, or systolic, occurs when the heart pumps blood into the blood vessels, and the lowest, or diastolic, occurs when the heart rests.

Blood sugar - *See* Blood glucose.

Calluses - Thick, hardened areas of the skin, generally on the foot, caused by friction or pressure. Calluses can lead to other problems, including serious infection and even gangrene.

Carbohydrate - One of the three main groups of foods in the diet that provide calories and energy. (Proteins and fats are the others.) Carbohydrates are mainly sugars (simple carbohydrates) and starches (complex carbohydrates, found in bread, pasta, beans) that the body breaks down into glucose.

Cholesterol - A substance similar to fat that is found in the blood, muscles, liver, brain, and other body tissues. The body produces and needs some cholesterol. However, too much cholesterol can make fats stick to the walls of the arteries and cause a disease that decreases or stops circulation.

Corns - A thickening of the skin of the feet or hands, usually caused by pressure against the skin.

Dawn phenomenon - A modest increase in blood glucose level in the predawn hours that corresponds with natural rise in counterregulatory hormones (cortisol, growth hormone, epinephrine) and insulin deficiency.

Diabetes - The short name for the disease called diabetes mellitus. Diabetes results when the body cannot use blood glucose as energy because of having too little insulin or being unable to use insulin. See also Type 1 diabetes, Type 2 diabetes, and Gestational diabetes.

Diabetes pills - Pills or capsules that are taken by mouth to help lower the blood glucose level. These pills may work for people who are still making insulin.

Diabetic eye disease - A disease of the small blood vessels of the retina of the eye in people with diabetes. In this disease, the vessels swell and leak liquids into the retina, blurring the vision and sometimes leading to blindness.

Diabetic ketoacidosis (DKA) - High blood glucose with the presence of ketones in the urine and bloodstream, often caused by taking too little insulin or during illness.

Diabetic kidney disease - Damage to the cells or blood vessels of the kidney.

Diabetic nerve damage - Damage to the nerves of a person with diabetes. Nerve damage may affect the feet and hands, as well as major organs.

Flu - An infection caused by the "influenza or flu" virus. See "Influenza".

Food exchanges - A way to help people stay on special food plans by letting them replace items from one food group with items from another group.

Gestational diabetes mellitus(GDM) - A type of diabetes that can occur in pregnant women who have not been known to have diabetes before. Although gestational diabetes usually subsides after pregnancy, many women who've had gestational diabetes develop Type 2 diabetes later in life.

Gingivitis - A swelling and soreness of the gums that, without treatment, can cause serious gum problems and disease.

Glucagon - A hormone that raises the blood glucose level. When someone with diabetes has a very low blood glucose level, a glucagon injection can help raise the blood glucose quickly.

Glucose - A sugar in our blood and a source of energy for our bodies.

Heart attack - Damage to the heart muscle caused when the blood vessels supplying the muscle are blocked, such as when the blood vessels are clogged with fats (a condition sometimes called hardening of the arteries).

HDL (or high-density lipoprotein) - A combined protein and fatlike substance. Low in cholesterol, it ususally passes freely through the arteries. Sometimes called "good cholesterol".

Hemoglobin A1c (now referred to as A1c) - A test that sums up how much glucose has been sticking to part of the hemoglobin during the past 3-4 months. Hemoglobin is a substance in the red blood cells that supplies oxygen to the cells of the body. Indicates level of control of blood glucose longterm.

High blood glucose - A condition that occurs in people with diabetes when their blood glucose levels are too high. Symptoms including having to urinate often, being very thirsty, and losing weight.

High blood pressure - A condition where the blood circulates through the arteries with too much force. High blood pressure tires the heart, harms the arteries, and increases the risk of heart attack, stroke, and kidney problems.

Honeymoon period - Within weeks after diagnosis of type 1 diabetes, there may be some recovery of beta-cell function; consequently, exogenous insulin requirements often decrease for weeks to months.

Hormone - A chemical that special cells in the body release to help other cells work. For example, insulin is a hormone made in the pancreas to help the body use glucose as energy.

Hyperglycemia - *See* High blood glucose.

Hypertension - *See* High blood pressure.

Hypoglycemia - *See* Low blood glucose.

Immunization - Sometimes called vaccination; a shot or injection that protects a person from getting an illness by making the person "immune" to it.

Influenza - A contagious viral illness that strikes quickly and severely. Signs include high fever, cough, chills, body aches, congestion, runny nose, sore throat, and headache.

Inject - To force liquid into the body with a needle and syringe.

Insulin - A hormone that helps the body use blood glucose for energy. The beta cells of the pancreas make insulin. When people with diabetes can't make enough insulin, they may have to inject it from another source.

Insulin-dependent diabetes - *See* Type 1 diabetes.

Ketonemia - An excess of ketone bodies in the blood.

Ketones - Chemical substances that the body makes when it doesn't have enough insulin in the blood. When ketones build up in the body for a long time, serious illness or coma can result.

Kidneys - Twin organs found in the lower part of the back. The kidneys purify the blood of all waste and harmful material. They also control the level of some helpful chemical substances in the blood.

Low blood glucose - A condition that occurs in people with diabetes when their blood glucose levels are too low. Symptoms include feeling anxious or confused, feeling numb in the arms and hands, and shaking or feeling dizzy.

LDL (or low-density lipoprotein) - A combined protein and fatlike substance. Rich in cholesterol, it tends to stick to the walls in the arteries. Sometimes called "bad cholesterol".

Meal plan - A guide to help people get the proper amount of calories, carbohydrates, proteins, and fats in their diet. See also Food exchanges.

Nephropathy - *See* Diabetic kidney disease.

Neuropathy - *See* Diabetic nerve damage.

Non-insulin-dependent diabetes. *See* Type 2 diabetes.

Pancreas - An organ in the body that makes insulin so that the body can use glucose for energy. The pancreas also makes enzymes that help the body digest food.

Periodontitis - A gum disease in which the gums shrink aways from the teeth. Without treatment, it can lead to tooth loss.

Plaque - A film of mucus that traps bacteria on the surface of the teeth. Plaque can be removed with daily brushing and flossing of teeth.

Retinopathy - *See* Diabetic eye disease.

Risk factors - Traits or behaviors that make it more likely that a person will get an illness. For example, a risk for getting Type 2 diabetes is having a family history of diabetes.

Self-monitoring blood glucose - A way for people with diabetes to find out how much glucose is in their blood. A drop of blood from the fingertip is placed on a special coated strip of paper that "reads" (often through an electronic meter) the amount of glucose in the blood.

Stroke - Damage to a part of the brain that happens when the blood vessels supplying that part are blocked, such as when the blood vessels are clogged with fats (a condition sometimes called hardening of the arteries).

Support group - A group of people who share a similar problem or concern. The people in the group help one another by sharing experiences, knowledge, and information.

Type 1 diabetes - A condition in which the pancreas makes so little insulin that the body can't use blood glucose as energy. Type 1 diabetes most often occurs in people younger than age 30 and must be controlled with daily insulin injections.

Type 2 diabetes - A condition in which the body either makes too little insulin or can't use the insulin it makes to use blood glucose as energy. Type 2 diabetes most often occurs in people older than age 30 and can often be controlled through meal plans and physical activity plans. Some people with Type 2 diabetes have to take diabetes pills or insulin.

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"DIABETES MANAGEMENT IN THE SCHOOL SETTING"
A Resource Guide for School Health Nurses

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Please return to: Diane C. Rackers
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Health Management

Diabetes touches every part of your life. It's a serious, lifelong condition, but there's a lot that can be done to protect your health. You can take charge of your health--not only for today, but for the coming years.

Diabetes can cause health problems over time. It can hurt your eyes, your kidneys, and your nerves. It can lead to problems with the blood flow in your body. Even your teeth and gums can be harmed. Many of these problems don't have to happen.

The more you know about diabetes and managing the disease, the better you are able to spot early warning signs and get the medical attention needed to successfully care for diabetes. A person's ability to monitor their own care on a daily basis makes a significant difference in controlling the condition and avoiding potentially serious complications. Taking care of diabetes is a team effort between you and your health care provider team (doctor, diabetes nurse educator, diabetes dietitian educator, pharmacist, school nurse and others). You are the most important member of the team. Take charge of your diabetes care by learning what to do for good diabetes care.

EYE PROBLEMS

Diabetic eye disease (also called diabetic retinopathy) is a serious problem that can lead to loss of sight. There's a lot you can do to take charge and prevent such problems. A recent study showed that keeping your blood glucose closer to normal can prevent or delay the onset of diabetic eye disease. Keeping your blood glucose under control is also important. Finding and treating eye problems early can help save your sight.

Even if you're seeing fine, you need regular, complete eye exams to protect your sight. You should have a dilated eye exam once a year. If you haven't already had a complete eye exam, you should have one now if any of these conditions apply to you:

1. You've had type 1 diabetes for more than 5 years.
2. You have type 2 diabetes.
3. You're going through puberty and you have diabetes.
4. You're pregnant and you have diabetes.

ORAL HEALTH

Because of high blood glucose, people with diabetes are more likely to have problems with their teeth and gums. There's a lot you can do to take charge and prevent these problems. Caring for your teeth and gums every day can help keep them healthy. Keeping your blood glucose under control is also important. Regular, complete dental care helps prevent dental disease.

1. Keep your blood glucose in control.
2. Brush your teeth at least twice a day and get a new toothbrush every 3 months.
3. Floss your teeth daily.
4. Get regular dental care. Have your teeth cleaned at least every 6 months and have a full dental exam once a year.

FOOT PROBLEMS

Nerve damage, circulation problems, and infections can cause serious foot problems for people with diabetes. There's a lot you can do to prevent problems with your feet.

Controlling your blood glucose and not smoking or using tobacco can help protect your feet. You can also take some simple safeguards each day to care for and protect your feet. Measures like these have prevented many amputations.

Signs of Foot Problems

Your feet may tingle, burn or hurt. You may not be able to feel touch, heat, or cold very well. The shape of your feet can change over time. There may even be changes in the color and temperatures of your feet. Some people lose hair on their toes, feet, and lower legs. The skin on your feet may be dry and cracked. Toenails may turn thick and yellow. Fungus infections can grow between your toes. Blisters, sores, ulcers, infected corns, and ingrown toenails need to be seen by your health care provider or foot doctor (podia–trist) right away.

Protect Your Feet with the following:

1. Get your health care provider to check your feet at least four times a year.
2. Check your feet each day.
3. Wash your feet daily.
4. Trim your toenails carefully.
5. Treat corns and calluses gently.
6. Protect your feet from heat and cold.
7. Wear shoes and socks ALWAYS.
8. Be physically active.

BLOOD PRESSURE CONTROL

Normal blood pressure will help prevent damage to your eyes, kidneys, heart, and blood vessels. Blood pressure should be measured at every routine diabetes visit. Epidemiologic analyses show that blood pressures >120/80 mmHg are associated with increased cardiovascular event rates and mortality in persons with diabetes. Therefore, a target blood pressure goal of <130/80 mmHg is reasonable if it can be safely achieved.

IMMUNIZATIONS

If you have diabetes, take extra care to keep up-to-date on your vaccinations (also called immunizations). Vaccines can prevent illnesses that can be very serious for people with diabetes.

1. Influenza (often called the “flu”) is not just a bad cold. It’s a serious illness that can lead to pneumonia and even death. You can help keep yourself from getting the flu by getting a flu shot every year. The best time to get a flu shot is between October and mid-November, but you can still get your flu vaccination even as late as January.
2. Pneumococcal (pneumonia) disease is a major source of illness and death. It can cause serious infections of the lung (pneumonia), the blood (bacteremia), and the covering of the brain (meningitis). Pneumococcal polysaccharide vaccine (often called PPV) can help prevent this disease. PPV can be given anytime throughout the year and usually is a one-time vaccination unless you have a chronic illness.

Standards of Clinical Care for Children

The following table outlines the type of care children should receive. Very young kids won't need everything (such as eye exams), but older kids, especially teens, likely will. Remember, this is only a guideline.

Care or Service	How Often
Visit with a doctor	Every 3-4 months
Visit with a dietitian	Every 3-4 months
Visit with a diabetes educator	Every 3-4 months
Blood glucose testing	Before meals and at bedtime, at a minimum. The more you test, the better you'll do.
A1C test	Every 3 months
Eye check for retinopathy	Yearly in children 12 or older who have had diabetes for at least five years
Urine test for microalbuminuria	Yearly after five years of diabetes or after puberty
Lipid profile (cholesterol and triglycerides)	Yearly
Height and weight measurements	Every visit
Thyroid functioning	Yearly

For More Information

- "Standards of Medical Care for Patients With Diabetes Mellitus" by the American Diabetes Association.
- "Clinical Practice Recommendations (2002)" of the American Diabetes Association.
- "How to Apply the Experience from the Diabetes Control and Complications Trial to Children and Adolescents?" by Stuart J. Brink discusses the importance of good control in children and adolescents and explains the clinical practices of the New England Diabetes and Endocrinology Center.
- "Medical Guidelines for the Management of Diabetes Mellitus" by the American Association of Clinical Endocrinologists
- "Diabetes Monitor" advises when to refer to an endocrinologist.

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Source: Children With Diabetes web site at http://www.childrenwithdiabetes.com/index_cwd.htm

Sick Day Rules

Illness is a stress that can lead to poor glucose control in both type 1 and type 2 diabetes. It can frequently lead to ketoacidosis in type 1 diabetes. When a patient is ill, changes in diet, medications, and monitoring may be necessary to maintain stability. The following guidelines are recommended during periods of illness.

I. MEDICATION

A. Patient must continue to take routine insulin (even if vomiting and unable to eat) or oral diabetes medication; may be necessary to switch to insulin temporarily or to change dose, but this is based on glucose test results and on advice from health care provider.

B. Patients taking insulin may require supplemental regular/rapid acting insulin every 3-4 hours based on glucose results and advice of health care provider.

II. MONITORING

A. **Blood Glucose:** should be tested at least every 2-4 hours; fingerstick measurements may not be reliable when glucose >400 mg/dl (>22.2 mol/l).

B. **Urine Ketones:** if glucose >240 mg/dl (>13.3 mmol/l), urine should be tested for ketones every 2-3 hours; patient should report moderate to large ketone levels to health care provider.

III. NUTRITION

A. **Fluid Replacement:** To prevent dehydration, which may be related to fever, diarrhea, nausea, and vomiting, at least 4-8 oz water or other fluids (caffeine-free, sugar-free drinks such as broth, tea, water, diet soda) should be consumed hourly, for a total of 8-10 cups of liquid a day. Broth is good for replacement of salt lost with dehydration. When regular meals cannot be consumed, carbohydrates in meals should be replaced with fluids or soft foods. If the individual is nauseated or vomiting, small sips of fluids or ice chips should be taken every 15-20 minute. An antiemetic is often required.

Examples of fluids containing 10-15 grams carbohydrate:
- 1 cup soup*
- 3/4 cup cream soup made with milk
- 1 cup Gatorade
- 1/2 cup fruit juice
- 3/4 cup regular ginger ale
- 1/2 cup regular soda

If blood glucose is >240 mg/dl, choose mostly sugar free liquids like water, diet soda, sugar free popsicles®, sugar free gelatin, tea, or broth.
Because caffeine acts as a diuretic, the fluids consumed should be caffeine-free

B. **Meal Replacement:** When patient is again able to consume food, small, frequent meals containing 10-15 grams of carbohydrates can be taken every 1-2 hours.

Examples of food containing 10-15 grams of carbohydrates:
- 1/2 cup sweetened gelatin
- 1/2 cup mashed potatoes
- 1 slice toast/bread
- 1 *regular* double popsicle

*Soup made with broth does not contain carbohydrate and should not be used to treat a low blood glucose reaction.

- 1/2 cup *regular* pudding
- 3 graham crackers
- 1/2 cup sherbet
- 1/2 cup custard
- 6 vanilla wafers
- 1/2 cup ice cream
- 1/2 cup cooked cereal
- 6 saltine crackers

IV. WHAT HEALTH CARE PROVIDERS SHOULD ASK PATIENT WHEN PATIENT IS ILL

A. **Length of illness**
B. **Glucose and urine ketone levels:** >240 mg/dl [13.3 mmol/l] and moderate to large ketone level)
C. **Presence and duration of diarrhea, nausea, or vomiting** (>4 hours)
D. **Change in body weight since onset of illness**
E. **Any other symptoms** (e.g., abdominal pain)
F. **Fever** (>101^{o}F)
G. **Medications** (dose, times of insulin injections, injection sites, and other medications taken)
H. **Quantity and kinds of food and fluids consumed during day**

V. USE OF INSULIN PUMPS WHEN SICK

Ilnesses are treated slightly different when the patient is using an insulin pump. What needs to be done is dependant on the current blood sugar level. The following are some general guidelines for illness management.

A. During **ALL** illnesses, blood sugar may be harder to control, so there is a need to test blood sugar more often to maintain good control.
B. It is important to **ALWAYS** keep some sources of quick sugar available. These will be helpful during sick days if blood sugar is running on the lower side. Regular popsicles and lollipops are suggested (not the sugar-free kind).

Adapted from: "The Diabetes Ready-Reference Guide for Health Professionals". 2000. American Diabetes Association, Inc. Department of Health and Senior Services , *Missouri Diet Manual*, 9th Edition, 2003.

Depression and Diabetes

Just about every child with diabetes feels emotional pain when he or she is diagnosed. This pain is likely to resurface when having diabetes makes it hard to just be a kid. As a result, the children who continue to have the greatest emotional pain from having diabetes often have the most trouble taking care of themselves and controlling their diabetes. This only further fuels their anger, fear, and resentment and can result in even more deeply rooted and lasting emotional turmoil.[1]

Signs and Symptoms[2]

If the student is having any of these problems, it's VERY important to have them talk to their parent, teacher, or other adult:

- Poor grades in school
- A lot of tardiness or absences from school
- Aches and pains that keep the student from doing what he/she wants to do
- Poor concentration
- Being bored
- Loss of interest in friends, sports, or activities
- Difficulty with relationships
- Crying and sleeping all of the time.
- Talk of or efforts to run away from home
- Feelings of sadness or hopelessness
- Increased irritability, anger, or hostility
- Extreme sensitivity to rejection or failure
- Changes in appetite
- Alcohol or substance abuse
- Reckless behavior
- Fear of death
- Thoughts of suicide

Frequency of Depression in Diabetes

- 33% of those with diabetes (type 1 or type 2) experience depression at some point in their lifetime.
- This rate is two to three times higher than that of the general population.
- Depression tends NOT to go away without proper treatment.

Impact of Depression in Diabetes

Depression is associated with:

- Higher risk of disease complications
- Poor blood sugar control

And with other factors that may worsen diabetes:

- Obesity
- Physical inactivity
- Noncompliance
- Substance abuse
- Smoking

Recognizing Depression[3]

The diagnosis of clinical depression requires that nearly every day for at least two weeks:

ONE of the following is present:

- Sustained feeling of sadness, depression, or extreme irritability.
- Loss of interest or pleasure in activities the student previously enjoyed

PLUS

FOUR of the following:

- A change in sleep patterns
- Increased or decreased appetite (With children it is important to note any failure in expected weight gain.)
- Difficulty concentrating
- Fatigue or loss of energy
- Feelings of guilt or worthlessness
- Recurrent thoughts of death or self-harm

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3. *Depression in Children & Adolescents* – A Fact Sheet for Physicians. www.nimh.nih.gov/publicat/depchildresfact.cfm National Institute of Mental Health, NIH publication No. 004744, 2000.

Source: *Depression & Diabetes,* Center for the Study of Depression in Diabetes at Washington University School of Medicine, St. Louis, Missouri

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